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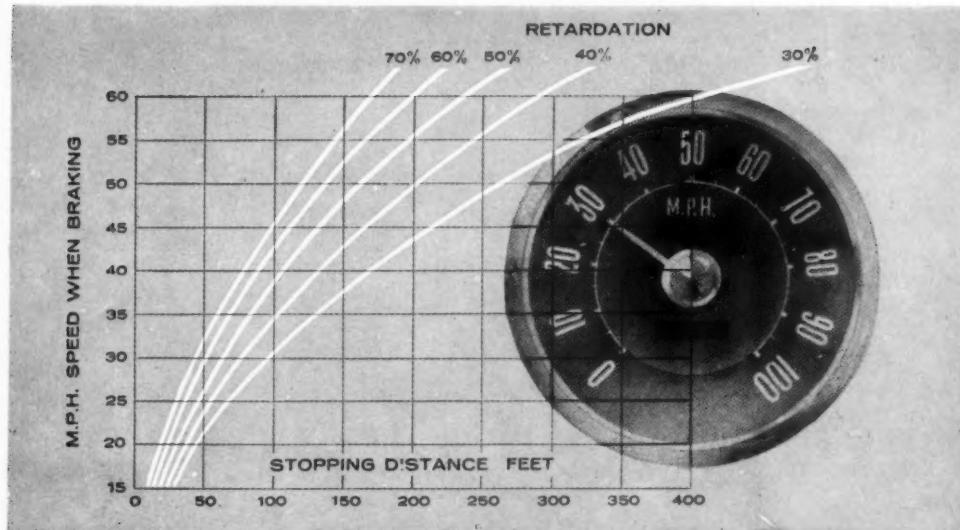
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Anchors Away

AUGUST is a treacherous month on the British roads; everyone who has a vehicle wishes to be out and about, overseas visitors are numerous in car and coach; L-drivers are to be seen everywhere. At the same time showers and storms are mixed in regularly with sunshine and thus, amidst thick and unpredictable traffic, the road surfaces are alternately dry and slippery-wet.

If a driver has to attempt an emergency stop, and finds he cannot come to a standstill quickly in a well-cared-for car, he is naturally indignant, blaming the maker of the car, the designer of the brakes, the supplier of the tyres and anyone else who comes to mind.

We have been outspoken on more than one occasion about tyre adhesion, both in print and to the tyre manufacturers, but it is only fair to place a large share of the blame for skids and lack of stopping ability where it belongs, namely upon any local road authorities who permit wholly unsuitable surfaces or top dressings on their roads, or who take no action when surfaces have become slippery through wear.

To take one example of what confronts the driver all over the country, in the short drive from Guildford, Surrey, to Epsom one may find a great variety of constructional materials. There are light-coloured road surfaces of concrete which are excellent when dry but inclined to be slippery when wet; there are granite chips of fawn or reddish colour which generally give good adhesion either wet or dry, and whether they are rough or smooth finished. One may run on to large, blue-grey, tarred stones which, when wet, give practically no adhesion at all, forward or sideways. There are also numerous patches where tarred stones have been used to fill in trenches and holes in an otherwise good surface. These can be most disconcerting to a driver and treacherous if he requires to stop quickly. May we stress that experience of this and other stretches of main road, with two different cars fitted in turn with various well-known makes of tyre, indicate that in wet weather it is the road surfaces and not the tyre treads or their rubber mixes which are mainly at fault.

Since these matters have such a direct bearing upon driving safety, they are certainly not to be dismissed with a shrug.

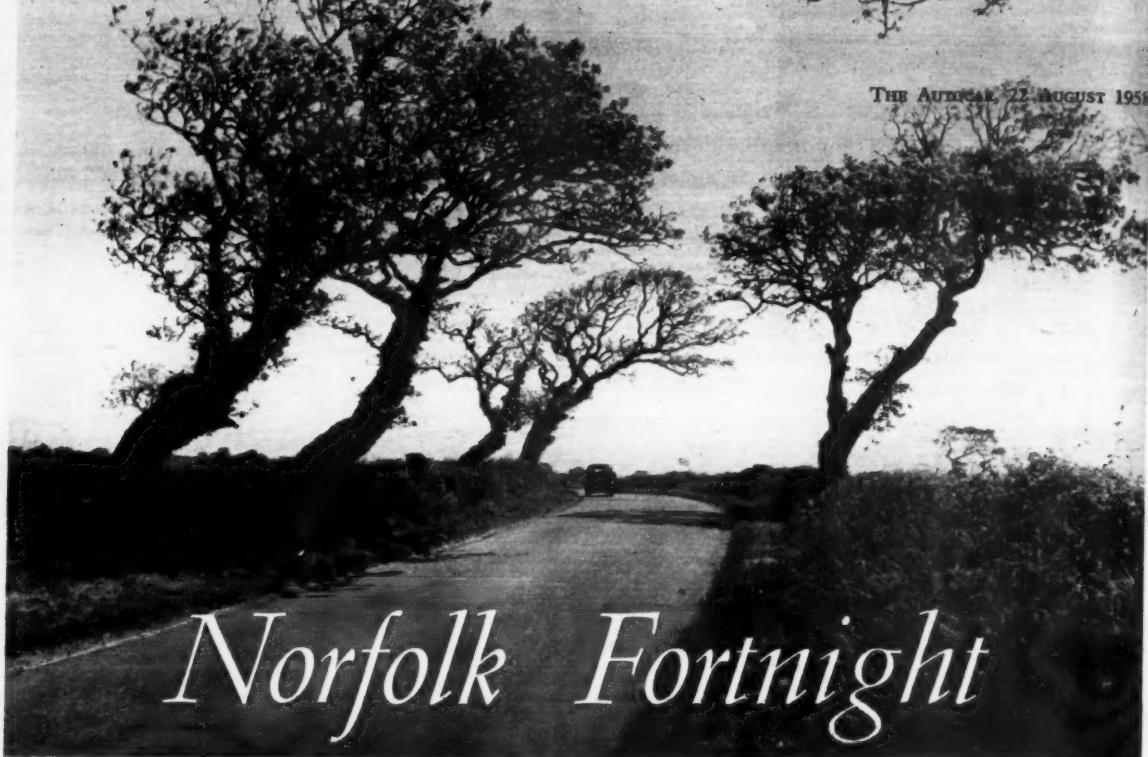
From Official Records

IN the latest report (for the year 1957) of the Road Research Board, a section of the Department of Scientific and Industrial Research, observations upon skidding and safety precede many pages concerned with road construction, and there is some cross-reference.

Records of accidents at 28 sites "showed a significantly high frequency of skidding in wet weather, and with one exception these sites had sideway force coefficients below the suggested standards." Again, it is recorded that of 56,400 accidents in the wet, 27.5 per cent involved skidding, but of 147,500 accidents in the dry, only 7.5 per cent involved skidding. The marked percentage difference surely suggests a promising line of action for accident reduction.

So far as the motorist is concerned, methods of road construction, wear resistance and so on, are of negligible interest unless the resulting road is a good, safe one for its primary purpose. Very briefly summed up, it should offer the maximum of adhesion, wet and dry, should have no treacherous qualities and, for night driving, the surface should be light-coloured.

In the circumstances, we urge motorists to become colour-conscious, and to make a point of studying the appearance of the surface they are traversing, so that they will be forewarned in wet weather. We hope that the authorities concerned will take a responsible interest in the driving safety aspects of road construction, as well as in costs and durability.



Norfolk Fortnight

BEAUTY, PEACE AND QUIET ON THE DRIER SIDE OF BRITAIN

OUR introduction to Norfolk could not have been better. On arriving at the George Hotel, Swaffham, though it was well after the official mealtime, we were welcomed and given an excellent dinner, after which we drove on to our bungalow at West Runton in just the right mood to start a holiday.

The beauty of the scenery here surprised us—we had not expected the high ridges of pine woods and open heathland, affording wide sea views which were particularly magnificent at sunset, nor the considerable sandy cliffs. West Runton is one of a succession of coastal villages which, with their beach-flint walls standing foursquare to the north-east gales, are unusual and unspoilt. The power of these gales is shown by the angle of many of the roadside trees, but the East Coast lived up to its reputation for summer sun, and we were able to tour under ideal conditions, as well as to laze on the wonderful stretches of sand. Any way to the shore between Sheringham and Yarmouth terminates in miles of sands far too extensive ever to become crowded.

Our one-inch maps were invaluable, for Norfolk hides the best of itself down by-roads. The straight main routes, although a

joy to the fast car driver in a hurry, miss the finest of the countryside, and there are few hills from which to observe the surroundings. Only small lanes lead to the "staithes" or mooring places along the coast and on the Broads, that unique network of inland lakes and rivers. None of the great houses, except for the Tudor East Barsham Manor, built of richly ornamented brick with the Royal arms over the gateway, is visible from a classified road. It was from here that in 1511 Henry VIII walked barefoot along what is now B1105, in pilgrimage to the shrine at Little Walsingham, which in those days was famed all over Europe.

After enquiries into the opening days and times—most of which were diff'rent—we were able to visit several of these great houses and estates which are, perhaps, the most striking feature of the county, among them the Queen's residence at Sandringham, where we spent an afternoon in the park and gardens and admired a wonderful display of flowers in the Royal greenhouses.

One of the finest houses in England is the great Jacobean Hall at Blickling, near Aylsham. Peacocks give the last touch of elegance to the superb formal gardens, and the house itself, now owned by the National Trust, is full of fine furniture, pictures and tapestries. The manor was held by King Harold before the Norman Conquest, and Anne Boleyn spent most of her childhood there. Even today, it is said that once a year four headless black horses draw an eerie coach through the main avenue of the great park, within it the ghost of Anne with her severed head in her lap.

No tragedies, but only a story of great achievement, attach to Holkham, the immense eighteenth-century house near the old port of Wells-next-the-Sea. It was here that "Coke of Norfolk," Earl of Leicester, reclaimed the present fertile estate from a sandy barren flat where "two rabbits quarrelled over one blade of grass." Now a great herd of fallow deer grazes in the park, and the house contains a fabulous collection of art treasures.

The fifteenth-century Oxburgh Hall, near Swaffham, is perhaps unequalled for sheer loveliness. The impressive gate tower of deep red brick rising from a wide clear moat reflecting the blue sky made a picture we shall long remember. After seeing the King's Chamber, where Henry VII lodged, and the Oxburgh Hangings, needlework of Mary, Queen of Scots, we climbed to the roof and looked out past the intricate brickwork of tall chimneys over many miles of woods and fields, knowing

"... the power of the north-east gales is shown by the angle of many of the roadside trees . . ." (above)

"... an exceptionally lovely harbour is at Blakeney Quay . . . there are reminders of Dutch landscapes . . ."



that our journey to Norfolk would have been well worth while for this alone.

Particularly we enjoyed our drives along the north coast towards Cley, Blakeney and Wells, and, incidentally, had one of the best lunches we have enjoyed anywhere in the Swiss Restaurant at Weybourne.

An exceptionally lovely harbour is at Blakeney Quay, where small coasting vessels tie up among a host of yachts and dinghies. Once much trade with Holland was carried on here, and there are reminders of Dutch landscapes in the low-lying salt marshes with their dykes and sea lavender, and the occasional windmill, now unfortunately falling into disrepair.

These bird-haunted shores are an ornithologist's paradise, and there are important sanctuaries at Blakeney Point and Scolt Head, where the Nature Conservancy allows restricted access. Another nature reserve under the care of the National Trust is at Horsey Mere, in Broadland, and it was here that we were lucky enough to obtain a close view of the bittern, one of Britain's rarest birds, and a swallowtail butterfly, looking like some bright tropical fragment as it flew among the bulrushes.

Norfolk's best-known holiday area, the Broads, is not really motorists' country. It is possible, however, to see something of its beauty from a car by discovering the lanes leading to the water, particularly round Coltishall, Wroxham, Horning and Potter Heigham. Leaving the car for a day, we hired one of the motor boats which are available at any of these centres, and I strongly recommend visitors to do the same, spending at least a few quiet hours on these tranquil inland waterways. Car owners will have an advantage here, for hiring rates are considerably less at some of the smaller boathouses in villages such as Ludham than they are in Wroxham or Potter Heigham.

Inland, driving along quiet by-roads, past hamlets, ruined priories and picturesque mills, we revelled in the lack of traffic which was noticeable throughout our holiday, even on main roads. There are many airfields hereabouts, necessitating crafty navigating when they are not shown on the one-inch map and one has to find the way round.

Most of them, in contrast to the American bases where the giant atom-carrying jets stand in readiness, are old wartime fields, no longer used. Only the larks sing above the deserted runways where once the bomber fleets took off into the evening sky to secure for us, among other things, the right to motor where we will. There is now a memorial chapel of great beauty in Ely Cathedral dedicated to those who did not return, and the age-old peace has come back to this wide countryside, in which there is still no sign of modern industry except near the few large towns.

We were able to see something of these towns, and combined our visit to Sandringham with a morning in King's Lynn, which was a port as far back as Saxon times and once the third greatest in the Kingdom. Today it is a fine, prosperous market town with some intriguing streets and old buildings near the harbour, among them the Customs House and the flint chequerwork Guildhall.

Our time in Norwich was far too short, for there was so much to see. The open-air market had a Continental look in the hot sun, with its striped awnings and bright flowers and fruit. After parking with some difficulty, we saw the magnificence of the Cathedral, its lofty spire a landmark for many miles around, and looked out over the city from the massive Norman castle. We window-gazed in the fine shopping centre, then strolled through the quiet of the close to Pulls Ferry, the old watergate to the Cathedral, and one of the loveliest reminders of old Norwich.

We found Elm Hill, a cobbled street little changed since mediæval times, and the magnificent fifteenth-century town house known as the Strangers Hall, where the panelled rooms have been furnished in the style of various periods and give a fascinating glimpse of the way our ancestors lived.

Great Yarmouth is really two towns in one, the colour and industry of the great herring-fishing port in sharp contrast with the holiday town with its three piers and five-mile-long promenade. Here is the only big resort on this coast, the others, like Cromer and Hunstanton, relying more on natural attractions than organized entertainment.

The towns and countryside of Norfolk have an infinite variety, and the time for us to head southwards down the fast, straight roads came all too soon at the end of a memorable holiday.

I. MEREDITH.

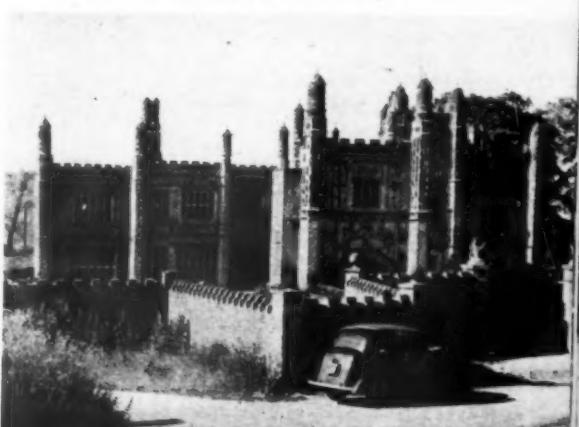


Elm Hill, Norwich " . . . little changed since mediæval times . . . "



" . . . a few quiet hours on these tranquil inland waterways . . . " at Coltishall (above)

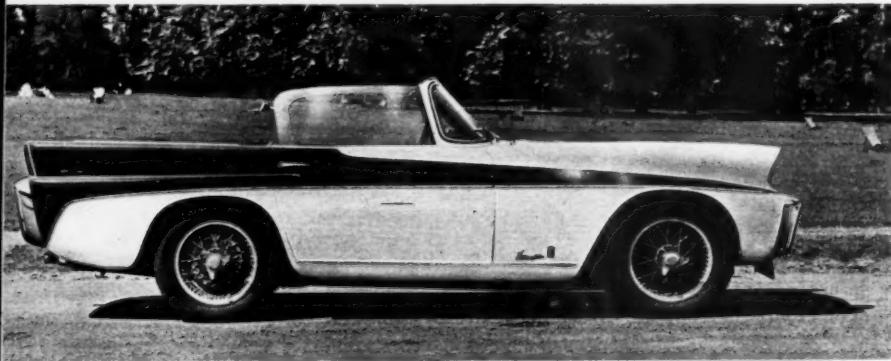
" . . . the Tudor East Barsham Manor, built of richly ornamented brick . . . "



Exotic Anglo-Italian TR3



MODEL IN MANY RESPECTS



Above: Normally folded right away, the soft hood offers good occasional weather protection. Note the styled-in, built-in bumpers.

Left: Mildly finned and dartlike—styling borrowed from aviation—the Michelotti/Vignale coachwork includes no fantastic or impractical features. Minor point of criticism is the sharp-edged, difficult-to-clean brow over each head lamp

WHEN I visit the various continental motor shows year by year and see the variety of attractive special bodies made for foreign cars of all sizes, I want to kick the British governments which have just about taxed our equivalent native craft and design skills out of existence.

Special coachwork designs and fashions are a highlight at Turin, Geneva and Paris, but at Earls Court they have been pushed more and more into the background and confined to a few very expensive examples on even fewer exclusive chassis. This is a great handicap to our export efforts, and a loss to our home industry and market.

Having said this much, I can go on to talk of a rare bird, the British sports car with an Italian body: One or two Jaguars, Aston and others have, of course, been so equipped in the past year or two, but only a very few.

Seldom can a car have attracted so much attention as does the works Michelotti/Vignale/Triumph TR3, now nearly a year old and normally used by the manufacturer's managing director, Alick Dick. Anyone who has the pleasure of using it for a few days needs to get used to continual quizzing. All kinds of people stop and ask: Is it the new TR? Is the suspension all independent? What is the engine like? Is the hardtop detachable? Are they Borrani wheels? Who made it? Are the gear ratios standard?—and so on.

Some of the answers are that except for details, it has a standard TR3 chassis, and is specially bodied for study in the TR development programme. It is a one-off design exercise, not a prototype as such.

In critical mood, I can seldom sit in a car or drive it without thinking "If it were mine, this and that would have to be changed for a start". After two weeks' regular use, the Michelotti TR seems to have more right and less wrong about it than any special sports car I can remember.

First, and briefly, the engine and chassis. The performance is all offered a little more sweetly than on the standard TRs I have sampled. Acceleration is very brisk and maximum speed is at least 100 m.p.h. The Laycock overdrive gives useful intermediate ratios between second and third, and third and top, as well as allowing a restful high cruising speed. The exhaust note is subdued. Plenty of sealing and sound proofing

keep noises out of the car, and the engine is flexible and smooth for a sports four-cylinder unit.

Disc brakes are fitted at the front only and pedal pressures are on the high side, but the driver never has cause to worry about stopping. In this connection the Michelin X tyres provide excellent grip in all circumstances. They heavy-up the steering at manoeuvring speeds but not sufficiently to matter, and the floating sensation they introduce at higher speeds is no longer noticed after an hour or two of driving.

Road holding is particularly good and the rear end behaves well on fast corners—no sliding or hopping. But ground clearance is at least 2in too low.

Alfredo Michelotti and Giovanni Vignale have respectively designed and built a very practical body as well as an attractive one. It is some 200 lb heavier than the standard model, but this weight includes a number of extras and the detachable hardtop, in addition to a hood. It seldom pays to say a car is beautiful or ugly, because opinions differ so much, but there is no doubt that most people find the lines very attractive in this case. The workmanship and finish are admirable, and the cost, one off, . . . but let's not go into that now.

An ample doorway avoids getting-in-and-out-troubles. The car is in black and white, both inside and out, relieved only by the leopardskin panels. The door-pulls lie flush and the driver's window winder folds flat





Unrecognizable as a TR3 but without a doubt most attractive, the car is here seen in the hardtop condition

The points which appealed to me in particular were the very good view from a compact, enclosed cockpit; the thin screen pillars, angled to give their minimum dimension across the driver's line of vision; then the boot, for a sports car, is very large and uninterrupted, lined stowage space being provided right across into the rear wings. So much space cannot have been easy to find because an 11½-gallon tank, the spare wheel and folding hood have to be stowed away in the tail as well.

Although the car is conveniently small, the cockpit is comfortably spacious for two, with plenty of leg room and enough clearance for head and elbows for a large driver.

To upholster the clutch and gear box hump and develop them into a console to carry ashtray and switches is a novel idea in this class of car. The leather-covered angle beside the driver's knee could be more rounded or padded with advantage. The diminutive gear lever is carried neatly and its knob is never more than a hand-span from the steering wheel rim. Very slick changes can be made, and the pedals are lined up conveniently and at a comfortable angle.

Being an exhibition showpiece, this TR is intentionally on the fancy side. I do not think a production version would have real leopardskin inlaid into the cream-piped black leather of seats and doors. The fur feels crisp, but is hot and rather slippery. The seats themselves are large, impressive but not very good. They have no wrap-round or shaping to hold you when cornering, and they are thinly padded beneath.

Grouping of the main instruments on a separate cowl panel in front of the driver, in the modern fashion, is to my mind right. For those who want to know the atmospheric conditions, an altimeter, hygrometer and air temperature gauge are neatly placed in the centre. I take a childish delight in a well-designed, self-extending and retracting radio aerial which whines up

or down when the radio is switched on or off. The tone of the radio on this TR is good and the set is very selective. The volume control is rather too sensitive.

The wisdom of building the bumpers in with the body—a common practice these days—seems questionable. They are rigid enough to take a gentle tap but a good bump must surely be transmitted to the body panels, with the risk of expensive local deformation. There is no doubt about them being neat.

A sports car with a detachable hardtop is an excellent compromise. For weeks at a time the hardtop may be hung in the roof of the garage, while in the winter it stays on and gives the snug interior of a saloon. I never have liked side curtains—a winding window is always to be preferred. So there are two possible shortcomings to some people's way of thinking: the substantial, framed windscreen when the car is open, and heavier, thicker doors to accommodate the winding windows. The Michelotti car has no pockets in the door, but a good map container is located on the left of the passenger's floor.

Sun visors remain a problem on convertible cars. If they are to be big enough to do their job well they are a nuisance and have no place when the top is down. Rigid, transparent materials have their advantages but in a shunt might slice off the top of your head. There used to be roller-blind type visors. Perhaps the best answer will be a detachable visor with safely rounded attachment fittings.

This car was lent for sampling, not road testing, and to say much more would be to whet appetites that cannot be satisfied. But this is not to suggest that Triumphs will neglect the lessons to be learned from such a "special." In fact, there is no doubt that even now the Company is cooking up ideas and developing design features to be incorporated progressively in TR3 successors.

M. A. S.

Left: A very good boot for a sports car, wide, uninterrupted and neatly trimmed. The spare wheel is beneath the floor. Right: Cockpit—the driver's instruments are grouped directly in front of him, the tiny gear-lever is just under his hand, the screen is moderately and attractively wrapped-round, the radio is neatly built in, there is plenty of leg room and space around the pedals. The steering wheel might be an inch smaller in diameter





Japanecdotes

RANDOM MEMORIES OF A SPRING JOURNEY

IT used to be said of the Japanese that they mounted horse-back from the right, preferred black teeth to white, and uncovered their feet rather than their heads out of respect. Certainly, the last comment is still true, for it is never wise to travel in Japan with holes in one's socks; one is forever removing one's shoes at restaurants, temples—even in aircraft equipment maintenance shops.

Yet of all the world's countries, perhaps none is changing its ways and its tempo more rapidly than Japan. Even the people themselves are changing, for recently I read that the average height of a 14-year-old boy in that country increased, during the period 1948-55, by three inches; at that rate, the traditionally rather small Japanese will have become monsters within a few decades, larger even than their giant Sumo wrestlers of today.

Doubtless Nature will arrest this alarming tendency in the nick of time, before they outgrow both their dwelling places—when the modern constructions of stone and concrete will prove less adaptable than bamboo and paper—and their means of transport. Yet to see three generations of a Japanese family together is generally to confirm the statisticians' findings. The same source stated that their mental growth was reacting conversely; perhaps improved nutrition and more equitable living conditions are bringing about a lethargic counteraction.

In the big cities, blatant Westernization, which infiltrated

deeply during the post-war U.S. occupation, is in immediate juxtaposition with the traditional Orient. Bright city arteries flanked by modern shops and office blocks, at night a dazzling blaze of neon, feed into slender veins of antiquated alleys—often impoverished, always fascinating, and after dark a romantic fairylane lit by thousands of multi-coloured lanterns.

Throughout the sprawling, seething suburbs of Tokyo and in the business centre, there are 617 cinemas, many showing American and European films, by far the most popular during my visit being, strangely enough, *Bridge on the River Kwai*; and Western cabaret and vaudeville vie with traditional dramatic arts, such as the long-winded Noh play, and the more popular Kabuki music and dancing.

Japan even has her own Elvis Presley, one Masaaki Hirao, whose "cultivated curly hair" (I quote from the *Mainichi*, a leading Tokyo monthly journal) "has been allowed to creep over his forehead and the tops of his ears." During his presence at a recent festivity, one young girl was so possessed that "she mistook one of his fingers for a piece of octopus and bit it." In her frenzy she must have lost count. Teddy Boy attire, slick city suiting and Parisian creations contrast with the traditional *kimono*, *obi* (a wide, decorative waist-band), and wooden clogs.

To the short-term visitor to Tokyo, the ruling class seem to be the taxi-drivers. There are some 12,000 taxis in Tokyo

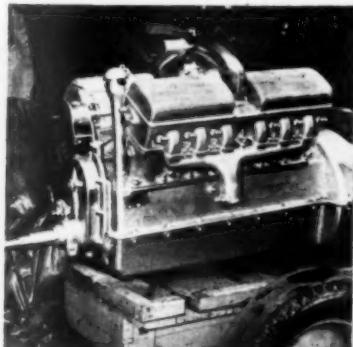
Left: Plague of the leather-jackets: week-end motor cyclists live fast and dangerously. Right: Grandma, wearing her Weathermasters, takes Honourable Junior plus tricycle for an outing in coil-sprung wicker pram



Miscellaneous road transport at a level crossing, snapped from the Hato express between Tokyo and Nagoya



Above: Professor Hama with his Lancia Lambda. Right: The professor's 23/70 Berliet of about 1924. Extreme right: One of his vee-12 Hali engines, made at Cleveland, Ohio, probably in 1918



alone, drivers taking turns in 24-hour shifts. Without the taxis, the city's pulse could scarcely beat: with them in action, every individual's life is in peril. During last March, the Metropolitan Police Board instituted a Taxicab Safety Week, but the accident rate that week rose by 39.6 per cent above average. The police countered by ordering another safety week.

Although taxis rush about at breakneck speed and with staggering disregard for traffic laws, written and unwritten, few of them probably know where they are heading for, their drivers (nicknamed the *kamikaze* after the suicide pilots of wartime days) having little knowledge of the city's intricate pattern. Apart from one or two of the main boulevards in the centre, such as the Ginza (Tokyo's Piccadilly), very few streets are named.

The driver must first reach the required district, then enquire further of area police stationed in little huts at many road junctions. Even if your street is found the battle is not won; for the houses are numbered, not in progressive order along a street, but according to their date of construction. Many of Tokyo's citizens identify their homes with the nearest tram stops, I was told, and have no other clue to their whereabouts.

Private and business cards include on their reverse sides little maps and instructions in Japanese characters for taxi-drivers, yet one might hail several taxis before finding a driver who *thinks* he knows where to go. You, the passenger, then swallow half a dozen tranquilizers and shut your eyes. In fact, the cabbies are wonderfully adroit and could make a splendid showing on a Grand Prix circuit. But towards the end of a 24-hour spell, they become, like wasps in autumn, a drowsy menace to all.

Considering their rough treatment over atrocious road surfaces, Japanese cars, which are used as taxis in practically standard form, hold together remarkably well, particularly as to brakes. They share the teeming roads with all manner of devices, although the rickshaw has practically disappeared; three-wheeled

trucks powered by large air-cooled V-twins swing about bearing outrageous loads, and there are trams, buses, lorries, bicycles, scooters and motor cycles in profusion. There seem to be traffic lights (arranged horizontally) at almost every major or minor intersection, and drivers sound their horns at two-second intervals, regardless of circumstances, so that the rush-hour cacophony defies description. It is reduced, but not silenced, during the small hours of darkness.

In orderly contrast are Japan's trains, of which about a third (in track-length) are owned and operated by private companies. They run to strict schedules, are generally rather slow because of the narrow rail gauge, but are rarely late. They are generally clean, comfortable and well-equipped. Despite the gauge handicap, trains under development there have reached over 90 m.p.h. The best are fireproof, air-conditioned, have restaurant cars and soon will have earphones for radio.

In the midday Hato (Pigeon) express running between Tokyo and Osaka, Larry Phillips, of Rootes, took me to Nagoya to visit the Toyota car factory, a scenic journey which follows the coast past Atami—Japan's Brighton, where hot water flows from natural geysers—and includes splendid views of distant Mount Fuji. Incidentally, we discovered that the Emperor of Japan's brother was travelling in the second-class coach adjacent to our first-class observation car.

My presence in Tokyo was detected by the Sports Car Club of Japan and the Classic Car Club of Japan, some of whose members entertained me more than once. I was elected an honorary life member of the S.C.C.J. and presented with badges for lapel, tie-clip and car. The car badge now is displayed among the many others in London's Steering Wheel club.

Japanese sports car and Vintage car fans seem to have exactly the same approach to their hobbies as our own, although their numbers are limited because of the few appropriate cars avail-



Left: New shore road by Lake Ashi, near Hakone, a favourite resort for Tokyo citizens; above: Beside it, massive cedars mark the centuries-old Tokaido road

Japanecdotes

able. The S.C.C.J. has about 125 members, and holds annually about five 100-mile rallies (one a night navigation affair), three airfield sprints and two gymkhana. Its secretary is Mr. Mikizo Nosawa, who knows our country well and was a frequent visitor to Brooklands before World War I.

He told me that the Japanese racing driver, Mr. Okura, who drove a big Fiat in the first race at Brooklands in 1907, still lives in Tokyo and has only recently given up driving. Mr. Nosawa remembers when there were only about a hundred cars in Tokyo—70 per cent of them British makes such as Humber, Wolseley, Daimler and Armstrong Whitworth.

His student nephew, Shinichiro Nosawa, drove me to a western suburb to meet Professor Hama, a noted local collector of exotic machinery. He showed me two Rolls-Royces—a Silver Ghost with Packard body and a Park Ward Phantom II limousine—the handsome Berliet illustrated, a Type 35 G.P. Bugatti (with a complete spare set of cast aluminium wheels), a four-cylinder f.w.d. Alvis, an open Lancia Lambda, a 1928 Hispano (with body by Fountains of Horsham), a D6 Delage, three vee-12 Hispano aero engines (made under licence in Japan by Mitsubishi), two Hal vee-12 car engines, and many other treasures. Apparently, he brings the P II out for club members' wedding ceremonies.

A keen Classic Car Club member and frequent contributor to Japanese motoring journals is Mr. Shotaro Kobayashi, in whose wonderfully restored Model A Ford coupé we motored over the potholes of Tokyo for most of an evening. He owns also a Speed 25 Alvis, and earns his living by teaching Japanese to American diplomats—a lengthy process, since the Japanese alphabet alone has a vast number of characters, of which at least 2,000 have to be mastered to reach University standard.

During ten somewhat busy days in Japan there was one Sunday of pure holiday when, together with Chris Wren, well-known cartoonist of the aviation world, I was driven out to Lake Ashi (2,372ft above sea level) in a national park 70 miles west of Tokyo, by one Peter Hewett in his 220S Mercedes. Hewett, who is a director of a long-established British merchant company in Tokyo, combines a deep knowledge of ancient Japanese lore with the most up-to-date methods of weaving his way through the shambles of modern Japanese traffic.

Although the Hakone road is much better surfaced and engineered than most, Sunday traffic was as dense as in this country, and the universal 35 m.p.h. limit strictly enforced. We escaped several electronic speed traps, and had to keep an eye open for "Snowdrops" prowling on large U.S.-style motor cycles. Although we suffered no long hold-ups, Hewett remarked that he once remained stationary in a traffic queue for six hours.

Because few can afford to buy and run a car, there is a large motor cycle following in Japan, and many fine-looking machines are on sale. But their riders roar along with hair-raising abandon, swerving about the road with all the grace of a figure-skater, often two or even three abreast, and fearlessly overtaking cars on blind corners. Stylish and gaily-coloured motor coaches are also abundant, but always competently driven.

As we neared Hakone and began to climb over the beautiful wooded foothills—all cherry and maple and those other wispy, decorative trees familiar in Japanese paintings and travel

folders—the road became narrow and tortuous, and part-time police manned dangerous parts to enforce one-way traffic. Much of the road was flanked at each side by deep, wide concrete ditches, into which it would be all too easy to slip a wheel.

Hakone, a favourite holiday spot beside the beautiful Lake Ashi, set among rugged volcanic mountains, was the tenth traditional stopping place of 53 along a famous ancient road, the Tokaido, between the old capital of Nikko and Kyoto. Originally it was bordered throughout its length by pines and vast cedars, and at Hakone some of these magnificent trees still stand. Doubtless many were felled to provide pillars for temples and masts for ships.

We returned by a spectacular coastal road, keeping careful watch for cars wearing black licence plates; these are often loaded with members—mostly teen-agers—of "drivers' clubs," who hire them at weekends for about ten shillings an hour and cram as much desperate motoring adventure as they can into a few hours. Outside many houses flew carp-shaped windsocks in celebration of Boy's Day—a carp for every son. My! these Japanese are prolific. By the way, should you ever take a trip to Tokyo, watch out! For someone dies every 12 minutes—still three times too infrequently to keep up with the birthrate.

If you enjoy eating, Tokyo offers first-class restaurants of almost every nationality. There are superb beef steaks, and huge strawberries with rich, fresh cream were abundant in April, while Japanese beer is excellent. The locals, of course, gourmandize on anything from squids to seaweed, and one soon learns to use chopsticks well enough to avoid starvation. In traditional eating-houses one squats on a cushion on the floor for hours, and the food can be delicious—nameless things from the sea (retrieved by a fleet of 140,000 fishing boats) with chrysanthemum leaves and whatnots, washed down with hot *sake* rice wine. I enjoyed frequent hospitality but suffered no indigestion.

Japanese optical equipment is world-renowned for quality and low cost, and at the Osaka Trade Fair even Germans were buying it—to make faithful copies, no doubt. During my stay I dropped and broke a Yashica camera bought in the U.S.A. last year, and in despair took it to the firm's Tokyo depot. Please, would they repair it as quickly as possible? Yes, in one week. But in one week I would be back in England. One hour then. When I returned my camera was handed to me, as new again. Delighted, I asked for my bill. The assistant shook his head: "Service," he said.

To end on a motoring note, great things are in hand in the Land of the Rising Sun. One manufacturer, in an advertising folder, puts it like this: "Our engineers are tirelessly striving to improve upon the better for the realization of turning out the best automobile the customers deserve." Clear, if involved: but you try to put that back into Japanese!

RONALD BARKER

Growing (perhaps taller than their fathers) into a quickly changing world, two uniformed schoolboys smile from a passing train



In the workshop at Tring, Robinson and Derek Spencer remove one of the side tanks, secured to the frame by heavy elastic

THIS is the third instalment of a series of articles which are, in effect, the diary of events leading up to the creation and subsequent operation of a racing stable. It covers the choice of drivers and mechanics, and the early racing. Part 1 was published on 4 April; Part 2 on 13 June.

PART THREE

B R I T I S H R A C I N G P A R T N E R S H I P

THE first event for which the car was entered was at the Easter Monday Goodwood meeting; it had been completed at the Cooper factory only five days before the event was due to take place. With practice on the Saturday, this allowed only two days in which to carry out the final adjustments before the whole *équipe* set out from the workshops at Tring for the circuit. Unfortunately there was a blizzard at the time, and the van, trailer and car slithered to a halt on a snow-covered hill near Amersham.

Eventually, having backed the outfit to the foot of the hill and tried again, Tony Robinson reached Goodwood with five minutes to spare before scrutineering. Fortunately everything was ready; it was merely a question of taking the car off the trailer and pushing it straight in to the scrutineers.

Meantime the circuit, too, had become covered in snow, though this thawed in time for the formula 2 practice. Until that moment, the Cooper had not been driven and there was a great deal to be learned—particularly concerning pressures for the new Dunlop R5 tyres, which had been introduced this season and with which few people had had any practical experience. Lewis-Evans first took the car out; he completed ten laps, during which tyre pressure adjustments were made, and said he was entirely satisfied with it. Afterwards, Tom Bridger did a few laps, one of which was in 1min 45sec—only 3.2sec slower than Lewis-Evans' best. Finally, Stirling Moss had a go, and announced that, apart from a driving position tailored for pygmies (and he himself is small enough) it seemed a very much better car than last season's.

A small, short-wave receiving set (weighing only 6½ lb) had been fitted to the car for this meeting, with a view to obviating pit signals; it was powered by a special light-weight six-volt battery, produced by Venner. On the transmission side, a Pye set was used, of a type which is normally fitted to radio cabs in London. The G.P.O. was approached for a frequency band—and eventually the Partnership found itself sharing a frequency with London Airport and a number of commercial users. As well as a waveband, the G.P.O. issued a call-sign.

This, incidentally, was the first race to be run in Britain under the new formula 2 fuel regulation stipulating 100-130 pn aviation spirit, or Avgas. Most of the Coventry-Climax engines, including that fitted to the Cooper, had been tuned to run on 100-octane pump fuel, in accordance with last year's regulations. The Cooper was filled up with the new fuel—thereby losing power slightly, for with settings for the lower-octane pump fuel, the engine was not taking full advantage of the higher-octane Avgas. Time did not allow the engine to be removed and tuned for the new fuel on the test-bed, so, rather than resort to hit-or-miss methods, it was agreed to leave well alone.

It had been decided that Lewis-Evans was to drive in the formula 2 event, and Tom Bridger had been entered for the formula 1 race, for which eight formula 2 cars had been accepted (five actually started). The idea of this had been to give him the opportunity of driving in a long-distance race at

the beginning of the season—which, it was hoped, would stand him in good stead later in the year. Lewis-Evans made a poor start in his race—due to lack of experience with the car—but soon recovered his lost ground; on the second lap he moved up into fourth position, in which he remained for the rest of the race. In view of the lack of opportunity for testing, the fact that the engine was slightly down on power, and Lewis-Evans' need for experience with the car, this was considered satisfactory.

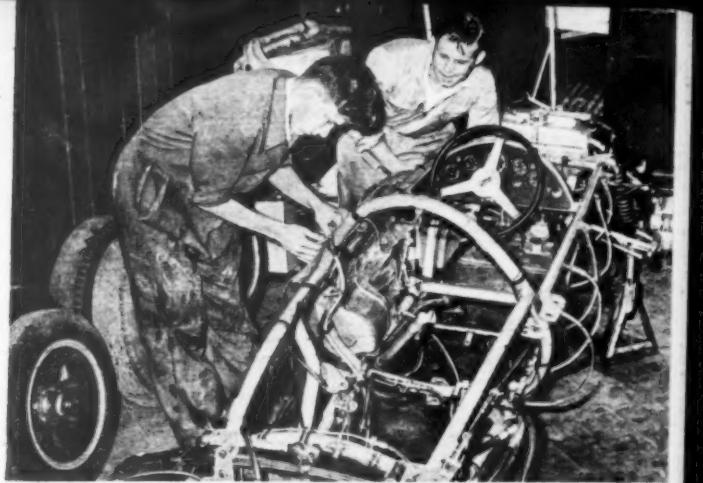
Later in the afternoon, Tom Bridger made a particularly good start in his race, and was well up with the leaders when he left the road at Madgwick corner—walking back to the pits to report that he, personally, was undamaged, but that the car had suffered considerably. It was later discovered that the braking ratio had been about 65 per cent on the rear wheels and 35 per cent on the front—which may have caused Bridger's mishap.

After the meeting, the Cooper was recovered from Madgwick and towed back to London—where the work of rebuilding was immediately started. It was discovered that a new chassis frame was needed; the car was entirely stripped down, the various components being fitted to the new frame. In ten days' time it was ready to race again.

So far as the cost of the repairs was concerned, it worked out this way. Very soon after the formation of the Partnership, it had been decided to take out a seasonal insurance policy that covered the car against accidental damage, the arrangement being that the Partnership paid the first £200 towards the cost of repairs. In fact, this meant the first £200 towards the cost of replacements, because Tony Robinson, being employed wholesale to maintain the Cooper, did all the work himself. In addition to this policy, a further insurance was taken out—again on a seasonal basis—whereby anybody who drove the Cooper, whether in a race or during official or private practice, was covered against personal injury. Both these policies were effected through insurance brokers at Lloyd's.

Early in the season Tony Robinson had suggested that in view of the heavy programme that had been planned it would be necessary to take on an assistant mechanic—even if this assistance was so "casual" that it was available only at each meeting for which the car was entered. Bearing in mind their policy of "bringing on" the junior driver, Tom Bridger, with

Brands Hatch, 8 June: Lewis-Evans wins both the ten-lap heats of the formula 2 race—and thus the aggregate results; in the process, he tied with S. H. Jensen's Cooper for fastest lap, in 58.2sec—a new record for the course





Body panels of the Cooper are removed out of the way by Tony Robinson, while work proceeds on the chassis.

Racing Partnership . . .

the help of Stuart Lewis-Evans, Alfred Moss and Ken Gregory agreed. At the same time that they trained a new driver, they felt, why not train a new racing mechanic?

As a result, an advertisement was placed in three leading motoring journals—and there were nearly 100 applications for the job. Eventually, Derek Spencer—a 17-year-old near-neighbour of Tony Robinson's—was signed, and he and Tony got to work, preparing the car for the Aintree 200 meeting, run by the B.A.R.C. on 19 April. For this event, the radio was not used. Though all the technical problems—cutting out engine interference and so on—had been overcome, it was found that the open exhaust, and the general engine noise coming from immediately behind the driver, made it impossible for him to distinguish the pit signals, though he could hear quite plainly that signals were coming through.

Lewis-Evans was chosen to drive in the Aintree race—again in a car that was pretty well completely new, having been rebuilt after its Goodwood crash. During practice it went well and, despite opposition from the formula 1 section of the race, recorded fifth fastest time, regardless of class. It was established that the car carried sufficient fuel to run the full 200 miles without stopping, and that the tyre wear would not demand a pit stop, with new tyres at the start and 5.5 mm of tread. In the race the car ran without trouble from start to finish, and finished second to Tony Brooks' formula 2 Cooper-Climax.

After Aintree, the car's next scheduled appearance was in the *Daily Express* Silverstone meeting on 5 May, with Stuart Lewis-Evans as driver. In the period between Aintree and Silverstone it was decided to strip it down to the chassis once again, and carefully to rebuild it, checking each moving part for wear. During this work it was discovered that the mainshaft bushes in the gear box were showing signs of pitting, and these were replaced; in every other respect the car seemed perfect. The circuit at Silverstone was then hired for testing, the day being spent in adjusting damper settings, the damper ratio between front and rear, and carburettor adjustments. This resulted in Lewis-Evans' putting in a lap at over 100 m.p.h.

During the official practice periods before the meeting, Lewis-Evans bettered this with a lap in 1min 44sec—which put him among the few drivers who, under official timing, had lapped the circuit at a speed in excess of 100 m.p.h.

In the race itself, Lewis-Evans—driving in perfect conditions—led the formula 2 category from the start until three-quarter distance, when Cliff Allison's works-entered Lotus passed him. Despite signals from the pit urging him to put on speed, he was unable to do more than hold his distance behind Allison; Lewis-Evans put in a lap in 1min 43.4sec, to which Allison retaliated with one in 1min 43sec, which now stands as the formula 2 lap record.

It was subsequently discovered that the Cooper's clutch had been slipping slightly and that, towards half-distance, the oil temperature had risen 'way over the safe limit. As a result he had had to ease back from time to time, so that the outcome of the race—in the circumstances—was considered satisfactory. For this, and all previous races, a maximum rev limit of 7,200 had been set, and both Lewis-Evans and Bridger had been remarkably good at keeping to it.

On stripping down the engine and gear box after Silverstone,

it was found that the clutch slip was due to an oil leakage from the gear box mainshaft, the oil creeping through into the clutch bell-housing and so to the clutch plates. It was decided, therefore, that between every race—even, when there was time, between practice and race itself—the clutch plates should be changed, a procedure that has been carried out ever since.

So far as the oil temperature was concerned, it was decided to fit an oil cooler. This was eventually fabricated by Tony Robinson out of parts remaining in a loft at Tring from the days of Stirling Moss' 250F Maserati. The signalling board, and numbers too, are relics of the Maserati days, having been made by Alf Francis, assisted by a younger Tony Robinson.

It was also discovered at about this time—through the experience of others, fortunately—that unless the valve springs are changed fairly frequently, there is a danger of dropping a valve in the Climax engine. The springs, therefore, are changed after every third event; when taking the engine down after the Silverstone race, in order to fit new springs, Robinson found that in every respect it was in first-class condition and, in fact, it had not yet given any trouble at all in any of the events in which the car had raced.

On 18 May Tom Bridger drove at Brands Hatch. Possibly because it was his first meeting since his accident at Goodwood on Easter Monday, he was a little worried and spent the race more or less in finding his touch again. However, the following weekend (on Whit Monday) he was at the Crystal Palace, and back on form. In the first heat he was able to keep well up with the leaders, finishing in 5th place, which made him a certain starter in the final. Making a really good start, Bridger was soon up into fourth position, then taking third place behind George Wicken and Ian Burgess who was in the lead. After a while, Wicken's engine lost its edge, and Bridger moved up behind Burgess, finishing the race in second place. Before Wicken eased up, however, he set up a new lap record for the Palace—in 1min 0.8sec, which was later equalled by Bridger.

Despite this satisfactory outcome of the race, Bridger had still felt a little worried about his responsibilities to the Partnership—and was far more concerned about bending the car again than he was about injuring himself; had the car been his own personal property he would have gone a great deal faster. This was clearly not the right state of mind in which to go motor racing and, after the race, it was pointed out to him that if, through an error, he bent the car, nobody minded—so long as he didn't bend himself. His only responsibility was to go as fast as he could, within the limits of what he considered to be safe—and to try to make it fast enough to win.

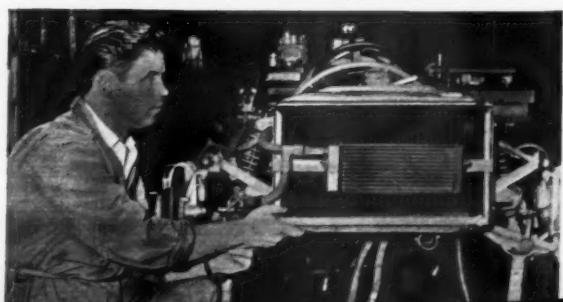
After the next meeting—at Brands Hatch, where Lewis-Evans drove the car and won both races (also recording, during practice, the fastest lap that had ever been achieved at Brands, in 57.8sec)—it was decided that it should be stripped down again to the last detail; 950 racing miles had been covered.

The engine went back to Coventry-Climax, was stripped and measured for wear. The total cost of this work, as well as replacements, was only £68—after three months of racing; this remarkably small outlay for so much work reflects great credit on the people who produced the engine.

At this stage, too, using the new Dunlop R5s, the car was on only its third set of tyres; two sets had been worn out and the third was pretty well worn. On most circuits these were found to be at least a second a lap faster than last year's Dunlops—on some circuits over two seconds.

The oil cooler which had been fabricated from Maserati parts after the Silverstone meeting in May had proved entirely satisfactory. The plan to change clutch plates after every meeting—though it was considered a bit of a luxury—had been carried out, and so far the car had not retired from a single race through mechanical failure.

An ex-250F Maserati oil-cooler has been fitted in front of the coolant radiator. It is planned to replace this heavy unit with two light-alloy gilled tubes, one of which is being offered up here



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At the front of the car are a double set of turn indicators, flashing in the white housings on top of the wings and in the amber-coloured nacelles below the head lamps. The individual parking lamps are also in the upper housings, while the ordinary side lights are in the head lamps



Autocar ROAD TESTS 1697

Borgward Isabella TS

THE Borgward company, of Bremen, offer a range of Isabella models, of which the TS—Touring Sports—saloon has the widest appeal. The standard saloon and the Combi estate car are equipped with the basic, 60 b.h.p. version of the 1,493 c.c. o.h.v. engine, while the TS and the attractive coupé (fixed head or convertible) have tuned units giving 75 b.h.p. Independent suspension is used all round. Except for the back loading door provided in the estate car, all the models have two-door coachwork. A full test of the TS saloon has been completed following provision of a car by the British concessionaires, Metcalfe and Mundy, Ltd., 280, Old Brompton Road, London, S.W.5.

First impression evoked by the Isabella is of its air of quality. Contributing to this are the high standard of paint-work and of detail fittings such as the winding ventilator windows in the doors; the number of instruments and minor controls; the finish of the protectively coated chassis; and the zip-case for handbook and documents. Although not of real leather, the upholstery is of a thick plastic imitation which looks both realistic and long-lasting, although the numerous exposed fasteners and the plastics window frames fall short of the standards of the coachwork as a whole.

Exceptionally large for a 1½-litre, the standard car with a bench front seat would hold up to six, while the TS, with separate front seats, will sit five comfortably, and allows space for a child at the front where the seats' edges overlap the transmission tunnel. Interior and exterior dimensions are similar to those associated with cars of two litres or more. While by no means a new design, the chassis incorporates unusual features, most important of which are the remarkably economical engine and the successful, swing axle i.r.s.

The two doors are really wide, making entry to the front seats simplicity itself, and, with these seats' backrests folded forward, entry to the rear is also satisfactory. The Reutter seats slide to and fro smoothly, and the rake of each spring-loaded backrest can be adjusted at the touch of a conveni-

ently placed lever. With the front seats set fully forward, beyond the adjusting notches provided for normal driving, the backrests will drop down to range with the forward edge of the rear seat. The seats themselves are rather hard but they are large and prove in practice to be comfortable on long runs. The front seats are curved enough to give a little lateral support.

Most drivers during the test considered that the non-adjustable steering wheel was set out from the facia an inch or two more than was necessary, but the only real complaint about the driving position concerned the awkwardly hinged, pendant throttle pedal.

Partly owing to the slim windscreen pillars there is good visibility, even though the farthest wing is obscured from



Speedometer and instruments are in front of the driver with, centrally, a pyramid of warning lights. The boss at the centre of the horn ring and steering wheel flashes the head lamps for signalling

Borgward Isabella TS...

The doors are wide, and on the driver's side is an external mirror, easily adjusted through the window. The petrol filler cap is reached through a flush-fitting panel beside the right rear lighting assembly



all but the tallest drivers by the over-high, domed scuttle and bonnet. A shallower, wider interior mirror would take more advantage of the large rear window, and there is, apparently, no reason why visibility in wet weather could not be improved by the use of longer wiper blades. The Isabella has a pear-shaped exterior mirror which is easily adjustable from the driving seat.

The engine starts on the ignition key, if not at a touch, at least at the first time of asking. During the damp but fairly warm weather accompanying the test there was no need to use the choke even when the car had stood out all night; the engine would pull well almost at once. The high overall gearing of the three upper ratios enables each gear to be held for a relatively long time, and to get the best from the car in typical British conditions the box must be used freely. First will run the TS up to a maximum of 27 m.p.h., second to 49 and third to 69 m.p.h. In top the maximum is markedly dependent on the conditions. The manufacturers claim 94 m.p.h., but in the indifferent weather of the test, which included a cross breeze, 86 m.p.h. was the highest true speed obtained.

Isabellas are a common sight on the *autobahnen* of Germany, and the handbook takes this into account with a suggested "all day" maximum cruising speed for the TS models of 82 m.p.h. Certainly a true 80 m.p.h. can be reached easily even on average English roads, which does credit to the combination of fairly small engine and large car. Surprisingly, even when the model is driven really hard the m.p.g. does not fall below 30, and cruising in the fifties, making no particular effort to be economic in the use of petrol, gave a creditable fuel consumption of no less than 37 m.p.g.

Synchromesh is provided on all forward speeds, and it cannot be beaten by fast changes. The steering column lever suffers from rather long travel and, in common with so many other change mechanisms of similar type, is rather slow between third and second. The gap between the planes carrying first and second, and third and top respectively, is commendably small. With overall ratios of 15.05, 8.38, 5.30 and 3.9 to 1, and 13in wheels, the change from third to second is used frequently, particularly in town, demanding an improved change between third and second. In towns the synchromesh on first proves well worth having. The choice of ratios appears to be splendidly suited to the conditions of the car's home country, and elsewhere where

Luggage space is considerable, and the contours of the compartment are well suited for carrying cases of any shape. Jack, wheel brace and tool roll are mounted on the right. The lid is released by a control inside the rear passenger compartment

motorway networks are widespread or traffic relatively light. There is some transmission noise on all gears, and the axle is not entirely silent. The clutch is by no means fierce, but is not quite as progressive as it should be.

If full use is made of the ratios for maximum performance the TS can be made to accelerate well; for example, the standing start quarter-mile can be covered in 21.7 sec, and 50 m.p.h. reached in 13.8 sec. In the lower speed range it takes 15.5 sec to reach 40 from 20 m.p.h. in top, but only 5.5 sec in second.

When high average speeds in tricky road and traffic conditions are not the prime consideration, the TS becomes a most restful car both for driver and passengers. The high gearing gives it long legs, and much is owed to the level ride provided by the all-independent suspension, and the particularly impressive insulation of the body from noise picked up or made by the road wheels. There is no suggestion whatever of the independent rear suspension affecting the steering, and the wheel grip is good, wet or dry. It was felt that slightly more powerful dampers would make the ride even better.

The steering is excellent. There is a slight degree of understeer, and a pleasant lightness and sensitivity; in conjunction with the very comfortable suspension, accurate placing of the Isabella is one of the pleasures of driving the car. There is no pronounced kick-back even on rough surfaces which, incidentally, can be taken fast without seriously impairing adhesion or ride.

When the windows are shut wind noise is slight, and while the engine and transmission can be heard, the overall volume





The TS Isabella is fitted with separate front seats by Reutter. Each backrest may be adjusted for rake by a small lever. The backrests will mate with the edge of the rear seat cushion. There is a single armrest for each of up to four occupants

of sound is not great. Both the triangular ventilator and main window in each door have winding mechanisms which work smoothly, and the rear passengers have a window on each side, hinged to open outward at its rear edge; to open a window makes a considerable increase in noise at the higher speeds.

The brakes were difficult to judge owing to a tendency on the car tested for the right front wheel to grab. A large proportion of the total mileage was covered on wet or damp roads, on which this one wheel tended to lock too readily. The impression was formed that the division of braking effort gave a little too much to the front wheels, but this opinion might be changed after driving another example of the model. As far as it was possible to judge it seemed that braking power fell short of the performance as a whole. The pull-out handbrake (pull-and-twist to release) under the centre of the facia was easily operated, and little effort was required to make it hold the car securely on steep gradients.

Instruments and minor controls are wide in range and well laid out. An outstanding feature is the precision with which the switches work, from the dip-switch upwards. The speedometer scale is horizontal, directly in front of the driver, with an angled red strip extending from left to right as the speed rises. That on the car tested was nearly accurate at 50 m.p.h., but became pessimistic below and optimistic above this speed. Under the speedometer are four rectangular dials. The one on the left houses the total and trip mileage recorders, then come the temperature gauge, fuel indicator and the clock. Between the two pairs of dials is a neat pyramid of warning lights; the small one at the top indicates main beam, then a wider one gives warning of lack of oil pressure, the third is for ignition, and at the base is a pair for the turn indicators. Knobs at each end of the panel look after setting the mileage recorder and adjusting the panel lighting.

An unusual lighter is placed in the centre of the facia panel—the element is exposed, and is operated by pressing a button in the side of its surround until the element glows. There are three neat, unlettered controls at each side of the lighter; nearest the driver is the ignition-starter, then are ranged choke, lights, wiper, right- or left-side parking lamps, and a manual control of the under-bonnet tap for the heater's hot water supply. The horn, the volume of which is not adequate out of town, has a ring on the steering wheel, while the central boss on the wheel flashes the head lamps for

signalling. This last control will flash the lamps when they are off or on dip; on main beam the dip switch is used. The dipper position is not as convenient on right-hand drive models as it is in its more usual location.

The heater is outstanding in effectiveness and in the scope and simplicity of distribution. Only the water tap control mentioned and the booster fan switch affect all the occupants. Apart from these, the heater is divided into two units, one for each side of the car. Driver and front passenger each has his own control, which may be set in any of four positions—off, full demist, demist and interior, and full interior. Even in exceptionally humid weather the screen could be demisted in a matter of moments.

Exceptionally good head lamps give plenty of penetration for fast motoring, in conjunction with really wide spread on dip. No oncoming drivers took exception to the dipped beams which, in addition to the spread, shone quite far forward. The panel lighting causes no reflection in the screen.

In spite of the thick backrests of the front seats, there is plenty of leg room for all occupants. Lack of a toe-board at the front is a fault. The flat floor meets a vertical bulkhead; a sloping foot rest would increase the front passenger's comfort. There is a non-lockable but lidded glove compartment in the left of the facia, and slim pockets in the doors; there is also a net holder for maps to the right of the driver's legs. There is an armrest on each door, but none centrally. In the conversion to right-hand drive the door locks have not been changed, with the result that only the near-side door, next to the kerb, can be locked or opened with the key.



Under-bonnet accessibility is good, and there is room to wield tools round most of the components which might require attention. The T-shaped pipe carries hot water to the divided heating system

Borgward Isabella TS . . .

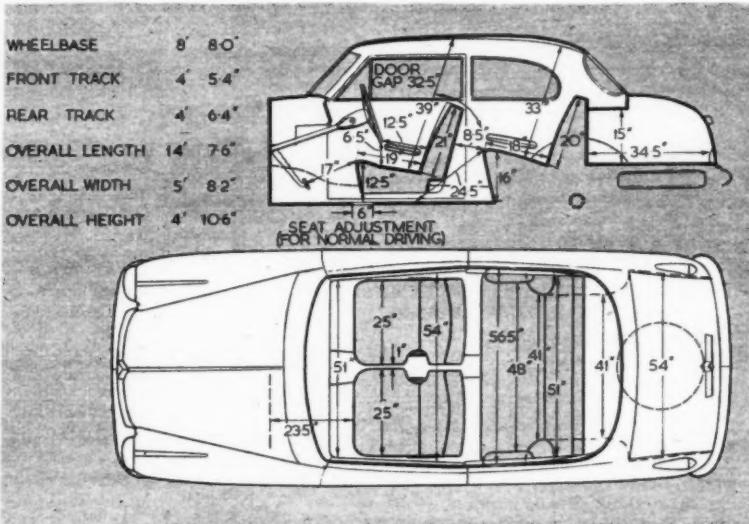
It is easy for the driver to slide across the seats, but the inconvenience is obvious.

The luggage locker is opened by a remote control in the rear passenger compartment, easily reached from the near-side doorway. The locker itself is well shaped for carrying a considerable quantity of luggage, regardless of the shape of the bags. The spare wheel has a separate container under

the floor, but luggage must be removed before it can be reached. The under-bonnet layout lends itself to easy routine maintenance; carburettor, plugs, coil and distributor are all within comfortable reach, and the battery may be topped up simply with a suitable pourer.

There is much to admire in this exceptionally large family 1½-litre, and little to prompt criticism. At a moderate ex-works price it provides roominess, high cruising speeds without fuss, quality construction, and unusually good fuel economy.

BORGWARD ISABELLA TS



Scale 1 in to 1 ft. Driving seat in central position. Cushions uncompressed.

PERFORMANCE

ACCELERATION:

Speed Range, Gear Ratios and Time in Sec.				
M.P.H.	3.9	5.30	8.38	15.05
to 1	to 1	to 1	to 1	to 1
10-30..	—	—	5.4	—
20-40..	15.5	9.3	5.5	—
30-50..	15.4	11.5	—	—
40-60..	17.8	11.9	—	—
50-70..	23.0	—	—	—

From rest through gears to:

M.P.H.	sec.
30	5.4
40	8.5
50	13.8
60	19.7
70	31.6

Standing quarter mile, 21.7 sec.

MAXIMUM SPEEDS ON GEARS:

Gear	M.P.H. (mean)	K.P.H. (best)
Top ..	87.5	140.8
3rd	91
2nd	49
1st	27

TEST CONDITIONS: Weather: damp surface, breezy; air temperature, 65 deg. F.

Acceleration figures are the mean of several runs in opposite directions.

Tractive effort obtained by Tapley meter.

BRAKES (at 30 m.p.h. in neutral):

Pedal load	Retardation in lb	Equivalent stopping distance in ft.
25	0.60	50
50	0.78	38

FUEL CONSUMPTION: M.P.G. at steady speeds:

M.P.H.	Direct
30	64.5
40	57.2
50	54.0
60	33.3
70	24.0

Overall fuel consumption for 786 miles, 33 m.p.g. (8.6 litres per 100 km.).

Approximate normal range 30-37 m.p.g. (9.4-7.6 litres per 100 km.).

Fuel: Premium grade.

TRACTIVE EFFORT:

	Pull (lb per ton)	Equivalent Gradient
Top	1 in 11.7
Third	1 in 8.4
Second..	..	1 in 5.8

SPEEDOMETER CORRECTION: M.P.H.

Car speedometer:	10	20	30	40	50	60	70	80	90
True speed:	18	26	32	43	57	58	68	76	85

DATA

PRICE (basic), with saloon body, £950. British purchase tax, £476 7s. Total (in Great Britain), £1,426 7s. Extras: Radio to choice.

ENGINE: Capacity: 1,493 c.c. (91 cu in). Number of cylinders: 4. Bore and stroke: 75.0 x 84.5 mm (2.97 x 3.32 in).

Valve gear: o.h.v., pushrods. Compression ratio: 8.2 to 1. B.H.P. 75 at 5,200 r.p.m. (B.H.P. per ton laden 61.8). Torque: 84.6 lb ft at 2,800 r.p.m. M.P.H. per 1,000 r.p.m. in top gear, 17.6

WEIGHT: (With 5 gals fuel), 21.25 cwt (2,380 lb).

Weight distribution (per cent): F, 52.6; R, 47.4. Laden as tested: 24.25 cwt. (2,716 lb). Lb per c.c. (laden): 1.8.

BRAKES: Type: Borgward. Method of operation, hydraulic. Drum dimensions: F, 9.06in diameter; 2.25in wide. R, 9.06in diameter; 2.25in wide. Lining area: F, 60 sq in; R, 60 sq in (99.0 sq in per ton laden).

TYRES: 5.90-13in. Pressures (lb per sq in): F, 24; R, 26 (normal).

TANK CAPACITY: 10½ Imperial gallons. Oil sump, 8 pints. Cooling system, 12 pints.

STEERING: Turning circle: Between kerbs, 32ft 10.75in. Between walls, 34ft 8.25in. Turns of steering wheel from lock to lock, 3.5.

DIMENSIONS: Wheelbase, 8ft 8in.

Track: F, 4ft 5.4in; R, 4ft 6.4in.

Length (overall), 14ft 7.6in.

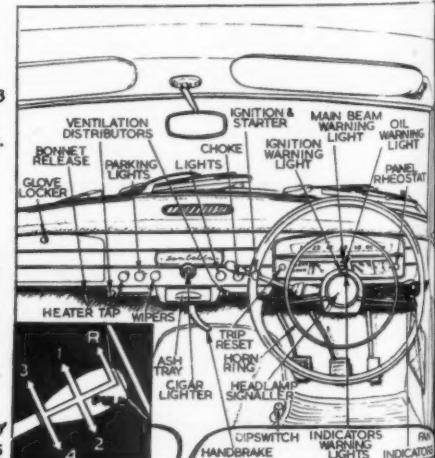
Width: 5ft 8.2in.

Height: 4ft 10.6in.

Ground clearance, 7in.

ELECTRICAL SYSTEM: 6-volt; 84 ampere-hour battery. Head lights: double dip; 35-35 watt bulbs.

SUSPENSION: Front, Independent, coil springs. Rear, Independent, coil springs and swing axle.



Disconnected Jottings

BY THE SCRIBE
Barry Appleby Drawings

Each to its Trade

AUTOMOBILE styling is not the ultimate sadness; last week-end I saw a "motoring boat," a product of general enthusiasm for going afloat, and it left me in conservative mood. I like boating boats, automobiling automobiles, and aeroplane aircraft, according to whether I am on or in land, sea or air, though I do recognize that war brings a necessity for things that mix up these functions.

Last week-end, an acquaintance mixed up *terra firma* and a river, and he reports that cars make bad boats. For a moment they promise to float, then a lot of water squirts in; finally you lower a window and pop out like a champagne cork leaving its bottle, or a kangaroo which has sat on a thorn bush.



Amphibious operations

Rash Voyages

THAT sort of misadventure is more common in rallies. I recall a Ford Zephyr in the eastern counties entering a river at a ford, and turning right instead of left. Rain poured, visibility was bad, and the driver pressed on. His head lamps submerged but continued to shine, and his ignition, which must have been marvellously damp-proofed, continued to work; but the engine power seemed barely adequate for these submarine larks. Finally, the front end dropped sharply, having gone over a small weir, and the car halted.

I have seen a trials car sinking in mud, which oozed up through gaps in the underside in disgusting sausages; these toppled slowly over, watched with horror by the crew.

Amphibians

IT is an interesting thought that the volume of a ton of water is something over 30 cu ft, so that pneumatic water wings, as used by "L" swimmers, would not need to be very big when applied to float a car. Well, some drivers seem to need them.

At Bigbury Bay, in Devon, there

used to be a car that crossed to an island hotel at high tide, via sands under a good depth of water. On a Model T Ford chassis had been erected a sort of scaffolding, bearing aloft the body, and the engine, which, if I remember rightly, drove the rear axle through an extremely long chain.

Electric Propulsion

MORE than once I have extricated a stalled car from an ordinary shallow flood by the use of bottom gear and the self-starter. On one occasion, after the car stuck in a river ford, the valiant starter actually began to heave the car up a steep bank with reluctant jerks. But at that point people who had hesitated to get their feet wet but were now helpful seized the front bumper, and the car emerged like Venus from the deep.

I like heavy-duty, big capacity batteries. They are heavier and costlier, but once in a while, in fog, breakdown, flood, dynamo failure or other circumstances requiring a good reserve, they show their worth.

Someone now tells me that you can wind a car out of a flood with the starting handle, preferably removing the plugs to release compression in the cylinders. A horrible idea: it almost reconciles me to cars without a handle.

Suitable Craft

EARLIER, I implied that I disapproved of being afloat in cars, or on land in boats. I have another hate: The Desperate Desert Venture. In order to carry a ton of baggage, a ton of water, sand tracks, anti-scorpion guns, glass beads and other trade goods, a marquee tent and a typewriter, not to speak of official documents, people will attempt to cross the Sahara in Austin Sevens.

They are invariably rescued, to the gratification of their publishers, by an ancient French lorry running a regular service with an unskilled Arab driver. Its original constructor—who built it to help the 1914-18 war along—scheduled it to carry five tons. In its old age,



Last straws

carrying a mere two tons, it provides reliable and regular desert-crossing transport.

There is a useful saying in Scotland, translated from the original Pictish into modern Doric, "You can't get kittens from a cat called Jock." In the same spirit, adventurers should use trucks, not private cars, for heavy haulage.

Life in Refinery

THE buying department of Esso, I heard, has received demands for crushed nut shells (for improving soil); shredded car tyres; 240 cu ft of oyster shells (for a filter bed); and twelve swans. The birds were wanted to keep down a certain weed in a reservoir. Before they arrived, nature supplied three wild ones, who fought a pitched battle with the newcomers.

Inside Information

LANCASHIRE County Council's "driver improvement school", in which the instructors are police, may leave a motorist armed at all points. Elementary education, a normal driving school where he may learn what test examiners like and dislike; secondary education, a course with the Lancashire police to learn the outlook of coppers; university, riding round and round Hyde Park Corner, London, England, to learn wingmanship and jungle-survival from Sergeant/Drivers-Taxi.

About this stage, the cadet becomes entitled to a commission.

Odd Calibration

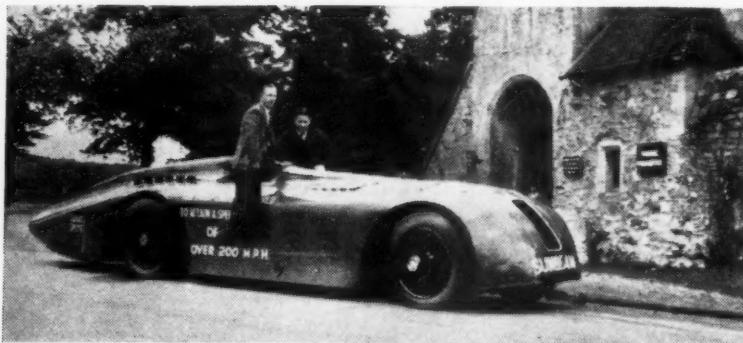
IT is general knowledge that the speedometer on the car of any other owner is flattering at high speeds. It just so happens that your own 80 m.p.h. is the only genuine one.

But I have just been startled by an instrument which *subtracted* from low speeds to a degree which could hardly have been accidental. Thus, "10 m.p.h." was a genuine 15, and "15" was a genuine 20.

Why the wrong calibration? The car has a fast-cruising top gear, and I think the idea of the speedometer error is to kid owners that the model is more flexible on top than in fact it is.

Becoming Useful

THE present required by a young relation is swimming fins. I live on high ground, myself, and can still manage with gumboots. If summer months get any wetter, fins on cars will cease to be mere styling.



THE 1,000 h.p. SUNBEAM, in which Sir Henry Segrave became the first man to drive at over 200 m.p.h., has been transferred from the Rootes Group Museum at Ryton-on-Dunsmore to the Montage Motor Museum at Beaulieu, Hampshire. It will be there on loan to Lord Montagu

B.M.C. Record Output

IN the financial year up to 31 July the total output of the British Motor Corporation was 504,712—claimed to be a record for any European manufacturer in a 12-month period. The total is an increase of 65,000 on the Corporation's previous best financial year (1955-56), and exports were also up by 16 per cent over those of the previous year. After the United States, B.M.C.'s largest markets were: Australia, South Africa, Canada, New Zealand and Sweden.

They estimate that home sales accounted for about 45 per cent of the total new car registrations in Great Britain during the year.

1959 Runs Start

BUICK and Chrysler both started assembly of their first 1959 production models on Monday, and on the same day workers at the Lincoln and Ford Thunderbird plants, and the Chrysler stamping plant in Ohio, returned to work following the settlement of their disputes.

Coventry Climax 1,100 Mark III

INCREASED power output has resulted from series of modifications to the type FWA 1,100 c.c. Coventry Climax engine, the newest version being designated the Mark III. This is the single overhead camshaft unit which has reaped so many successes in sports car events over the past few years. Performance figures have not yet been released by the manufacturers, but it is understood that these will be available within the next few weeks. The modifications include an increase in the compression ratio to 10.5 to 1, to suit 100-octane fuel, and revised valve gear to permit increased r.p.m.

Coventry Climax also offer a conversion kit to bring existing Mark I and Mark II 1,100 c.c. engines up to the new specification, this kit being divided into five sections, listed below, of which any one or more are available separately.

Next Week

- ★ Full description of a new 2.2-litre version of a well-known British car.
- ★ Road test of special interest—the Citroen ID19.
- ★ Illustrated report of the Portuguese Grand Prix.
- ★ Behind the scenes of international racing organization.
- ★ Touring, camping, Detroit notes, and all the other regular features.

Section A: power increase. Set of modified pistons and tappet block packing washers for use when 0.040in has been machined from cylinder head to raise compression ratio.

Section B: r.p.m. increase. Modified camshaft assembly, valves, valve springs and tappet-block assembly.

Section C: reliability. Connecting-rod assembly with 9mm connecting-rod bolts, to meet the demands of increased power and speed obtainable with sections A and B modifications.

Section D: durability. Valve guides and valve seat inserts to give longer life, when making use of the additional power provided by Section A modifications.

Section E: safety factor increase. Modified bearing caps to increase the factor of safety at extremes of higher performance available.

Farnborough Specials

NEXT week our associated journal *Flight* will publish the first of three special numbers covering this year's Farnborough Air Show. It will contain a complete and illustrated survey of Britain's latest service, civil and research aircraft and their power units, as well as advanced details of exhibits in the Farnborough "static" section. Called the *Britain's Aircraft Industry* number, it will be on sale from all newsagents next Friday, 29 August, price 2s 6d. The dates of the S.B.A.C. Farnborough display are Monday 1 September, to Sunday 7 September.

Vauxhall Retirements

MR. PHILIP W. COPELIN has been elected to succeed Mr. G. N. Vansittart, who is to retire at the end of September, as chairman of Vauxhall Motors, Ltd. He will continue to serve in his present capacity as managing director. Mr. J. R. Pearson has been elected deputy chairman, and Mr. C. A. Riddell has been appointed to the board. Mr. A. W. Laskey, the assistant managing director, will also retire at the end of September.

Mr. Vansittart joined General Motors, London, in 1925, and became chairman of Vauxhall Motors in 1947; in 1953 and 1954 he relinquished the post to become chairman of General Motors, London, but resumed the chairmanship of Vauxhall in 1954 in succession to Sir Charles Bartlett. He is 65.

Mr. Laskey, who joined General Motors, London, in 1923, was general supply manager of Vauxhall in 1929. In 1933 he was appointed to the board, and became assistant managing director of Vauxhall in 1939. He is 64.

Blackwall Tunnel Closings

FROM 4 p.m. on Saturdays until 5 a.m. on Mondays the Blackwall Tunnel, London, is to be closed every weekend from tomorrow until 29 September. Weekend closing is being introduced in connection with the construction of the new northern approach.



The R.A.C.'s Tourist Trophy will come back to circulation when the T.T. is revived under control of the B.A.R.C. at Goodwood, on 13 September

Vauxhall Labour Cuts

NEXT Thursday 600 men will be discharged by Vauxhall Motors, Ltd. The company state that "a disturbed political situation, notably in the Middle East, and economic restrictions in some other countries (import restrictions in New Zealand and Argentine, credit restrictions in South Africa) have aggravated the seasonal slackening in demand for vehicles."

Rhodesian Economy Run

A STANDARD Ensign with overdrive was the outright winner in the Rhodesian Mobilgas Economy Run with an actual m.p.g. figure of 48.1 (78.17 ton m.p.g.). Class winners were a Lloyd 600, Morris Minor, Vauxhall Victor, Renault Frégate and Nash Rambler. In the classes for cars with overdrive, an Austin A.105 (39.82 m.p.g., 72.27 ton m.p.g.) and a Jaguar 3.4 (35.59 m.p.g., 67.34 ton m.p.g.), were winners. The route covered 655 miles in Rhodesia from Salisbury to Bulawayo.

Interlaken's Meters to Go

LOCAL people in Interlaken, Switzerland, have won their battle against the parking meters which were installed there some time ago. Mr. E. Hess, manager of Interlaken's tourist office, commented: "Tourists who come here from all over the world do not want to be bothered with parking meters, and we must please them. I am glad the meters are going."

Jaguar "Off the Scale"

OUR American contemporary *Road and Track* includes a Test of the Jaguar XK150S Roadster in the current issue. This car is the improved performance two-seat version of the XK150, with three S.U. carburetors, a compression ratio of 9 to 1 and overdrive as standard equipment. The performance given for the test

car includes a figure of 21.4sec for acceleration from rest to 100 m.p.h. and a maximum speed of 136 m.p.h. The Tapley data include an impressive "off the scale" comment for the maximum effort in bottom gear.

Tariff Row in Australia

A FURTHER enquiry into the duty payable on fully-assembled cars for import to Australia has been instigated by the Department of Trade over there. The effect of the earlier investigation was to raise the prices of the more expensive British makes by several hundred pounds, and since then the representative of the S.M.M.T. has been making urgent appeals to Canberra for the subject to be reviewed. It is hoped that a decision will be made before the end of the year.

Road Courtesy Rally

NEWTON-LE-WILLOWS, Lancashire, road safety committee is holding a road courtesy rally on Sunday, 31 August. It will consist of a 40-mile road driving test, manoeuvrability contests, and a *concours d'élegance*. Entry costs 2s 6d. Applications should be addressed to the Secretary, Road Safety Committee, Town Hall, Newton-le-Willows, Lancashire.

Rambler Run Doubled

WHEN American Motors completed its 1958 run of Rambler production last week 162,182 cars had been built. This is an increase of 91 per cent over the 84,699 Ramblers built during the previous year. The plants will resume full production on 25 August.

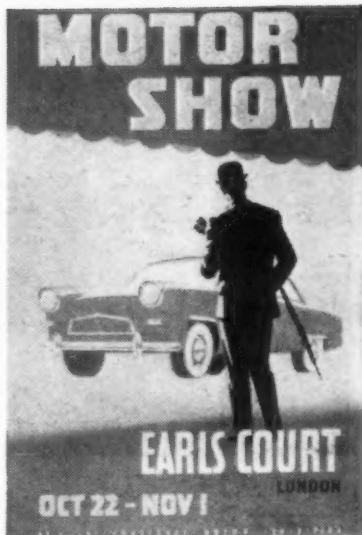
News From Germany

ALL manufacturing machinery, designs and drawings of the Zundapp Janus are for sale. It is reported that Skoda are showing strong interest in the offer with a view to producing the little car with a 350 c.c. twin cylinder Jawa two-stroke engine.

Production of the German Ford 15M has been discontinued. The side valve 12M, and the 17M, for which a four-door saloon body is soon to be available, continue in production.



TWO MEMBERS of the Oxford and Cambridge Far Eastern Expedition are making an overland trip to Burma — again by Land-Rover. They are photographer Barrington Brown (left) and author Tim Slessor, whose book on the Far Eastern trip, *First Overland*, was published earlier this year



Reminder

Coachwork at the Show

AT Earls Court this year the usual private coachwork competition will again be held, under the organization of the Institute of British Carriage and Automobile Manufacturers. The competition is open to all British products, and gold, silver and bronze medals are awarded for the exhibits judged to show the best design, construction and finish; there are 15 individual categories.

Autobahn Construction Accelerated

SPEAKING in Rendsburg, the West German Minister of Transport has said that construction of the important Hamburg-Basle autobahn is to be accelerated for completion by the end of 1961. It will provide a direct, fast route, of special value to Scandinavian motorists, through Germany to the south.

Double Lines in Scotland

DOUBLE white lines are to be marked out on a 25-mile stretch of the A9 (Edinburgh-Stirling) road in Scotland. It will be on the same basis as experiments already completed in the south, and the line-painting and signposting will be completed in a few weeks.

Thefts Increasing

SCOTLAND Yard has released the following figures of robberies in the London area, showing an increase in thefts from vehicles of more than 80 per cent in the last five years; and an increase of 126 per cent in the number of vehicles stolen:

Year	Thefts from vehicles	Vehicles stolen
1952	6,227	2,226
1953	6,443	2,134
1954	7,354	1,953
1955	8,234	2,474
1956	9,762	3,908
1957	11,248	5,053

For the first five months of this year the figures are; 6,275 thefts from vehicles and 2,619 vehicles stolen. Scotland Yard appealed to motorists: "Don't give your car or its contents away. Lock it, securely fasten windows, lock the luggage locker and do not leave property exposed to view on the seats."



Above: The Craftsman closed ready for towing behind a Sunbeam Talbot. In the folded position it is compact enough to travel by air ferry. Left: Fully extended with side curtains in position. There is ample headroom to stand erect for more than half the length of the van

Wessex Craftsman

A SPORTS CARRAVAN FOR THE ENTHUSIAST OR SMALL CAR OWNER

HERE are many devotees of the open air to whom, because they need either a higher degree of comfort than can be provided by tent camping, or require the ultimate in mobility, the folding caravan has an appeal. Another potential user of this class of trailer is the small car owner who does not want to overload his engine and transmission. With these uses in mind, Wessex Industries, Ltd., have produced their Craftsman caravan.

As will be seen from the floor plan, the Craftsman is basically a 9ft, two-berth van, the two beds, which are full length, taking up the sides and front, with the kitchen and cupboards at the rear. This arrangement shows much thought, because the rising roof hinges at the front, giving maximum headroom at the rear where it is most needed.

A glance at the illustrations will show exactly how the van is extended from the closed, towing, position. The roof is raised with one hand while the other pulls the folding top-half of the rear wall into the vertical, where it is locked. Two shaped pieces of heavy canvas are then fastened in position by press studs to fill the gaps left by raising the roof. These canvas panels fit inside at the top and outside at their lower edges, providing an effective runaway for rain water. When erected, the structure is very stiff.

One of the main advantages of this system of folding is that normal windows can be fitted, and there are, in fact, no fewer than six 17in windows and another of 23in. A feature which shows that the designer is a motorist as well as a caravanner is the placing of one of the rear windows in such a position that while towing, a clear "see through" is obtained via the normal inside car mirror. In order that the maximum view should be available the curtains can easily be dropped clear of this rear window.

On the road the Craftsman behaves very well. It was tested in heavy rain at speeds up to 70 m.p.h. without the slightest trace of instability developing.

Abrupt stops were made without the outfit getting out of line. Since the frontal area is only 5ft 6in by 5ft, and the front panel is curved, there is little extra wind resistance from that cause but, of course, the flat back does create a vortex, the retarding effect of which becomes greater as speed is increased.

Construction of the Craftsman is sound. There is a full chassis built up of 2in x 2in angle steel, boxed at all main points of stress, resting on seven-leaf, half-elliptic springs, 2ft 6in between centres. The 16in x 4in detachable wheels run on taper roller bearings.

Structural members of the body are all either of oak or ash, covered with tempered Masonite. Being essentially a holiday van, there has been no attempt at double-walled insulation, and this is no drawback; many pre-war caravans were single-walled and are still in excellent condition. This feature doubtless has much to do with the extreme light

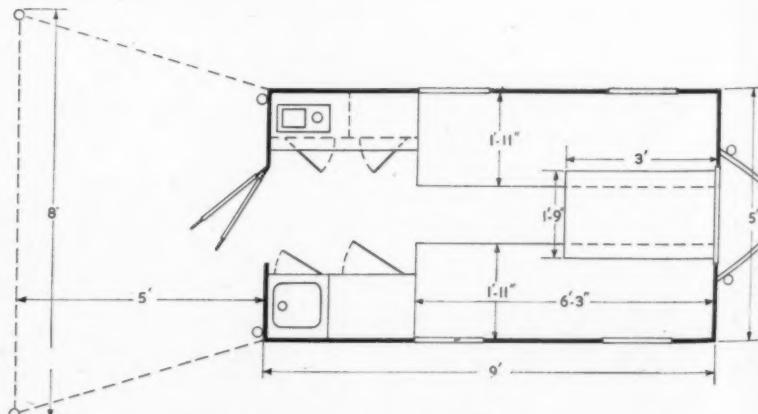
weight of the Craftsman, which scales only 5½ cwt.

As would be expected, in a van of such weight and dimensions, the provision of amenities is perforce elemental. There are, however, spring interior mattresses which form the two beds, beneath which are spacious storage lockers; and covering the ½in, five-ply, resin bonded floor is a fitted carpet. The kitchen comprises a sink, shelves, four cupboards and a Harper hotplate, which operates from a bottle of butane gas. For extra ventilation when cooking, the top half of the door can be opened independently of the bottom part.

Because it is unlikely that the Craftsman will project beyond the width of a towing car, only rear and stop road lights are provided and for these a two-pin socket is fitted at the bottom of the front panel. For interior lighting a second plug is placed on the near-side in a convenient place for use when the car is parked alongside at night. The controlling switch for the interior light has been thoughtfully situated on the side of one of the beds.

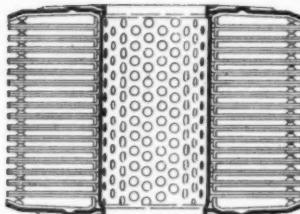
For those whose families require more accommodation, but whose cars will not pull larger vans, rear tents are available as extras. The smaller size is 5ft x 8ft and the larger 8ft x 8ft with side opening.

The price of the Craftsman is £198 ex works; the manufacturers are Wessex Industries (Poole), Ltd., Poole, Dorset.



Floor plan showing the interior layout of the Craftsman

O I L



F I L T R A T I O N

Current Requirements : Recent Developments

Top centre: A Purolator sealed by-pass filter which is unscrewed from the crankcase and discarded when a replacement is needed. Top right: A Fram cartridge element cut-away to reveal the pleated close-pore paper which is the filtering medium

Above and right: In the latest AC range of oil filters, sludge packets are formed between pairs of impregnated paper discs. Oil flow is from the outside of the element through the discs to the centre tube

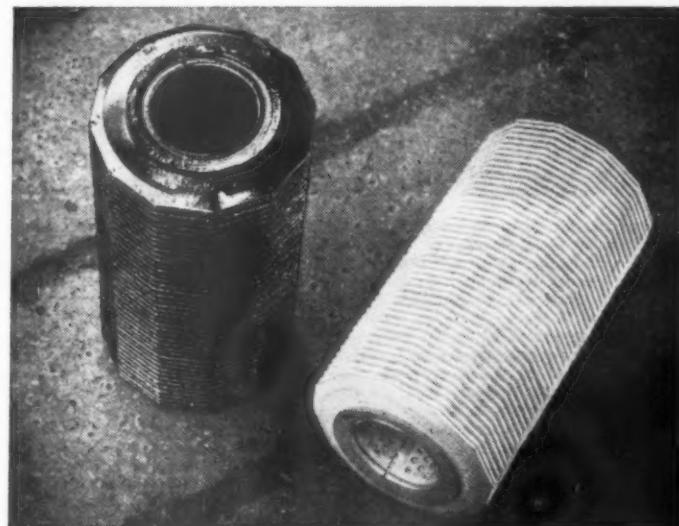
AN internal combustion engine is a peculiarly difficult machine in which to maintain a clean supply of oil to the working parts, and yet failure to do so can give rise to rapid wear and even eventual seizure of some component. The reasons are threefold.

First, dust-laden air, continually inhaled into the cylinders, comes into contact with the oil-wetted cylinder walls. As the oil is scraped from the walls and returns to the sump, some of this dust is carried with it. Dust may also enter through the crankcase breather. Although filters are generally fitted at the carburetor intake and breather they rarely remove all the dust in the ingoing air.

Secondly, there is always an escape, however small, of the burning petrol-air mixture past the piston into the crankcase, which causes contamination of the oil. Incompletely burnt fuel produces carbon, which collects in the oil and forms the sticky and familiar substance known as sludge.

Also the oil is continually in contact with the very hot parts of the engine, such as the undersides of the pistons and the cylinder walls, which leads to charring of the oil and further production of carbon. Lastly, as water is a product of combustion, there is always the likelihood of steam condensation inside the engine. Water tends to form emulsions with carbon and other solid products which are deposited as "cold" sludge. Short journeys, during which the engine never reaches its proper working temperature, encourage this trouble.

A further cause of engine wear is the presence in the lubrication system of small metal turnings and swarf, which it has not been possible to clear away after engine manufacture. Even though great efforts are made to remove them (engines are run



on the bench with a continuous supply of fresh oil and sumps are removed to drain the circulated oil) there is always the danger that some debris may remain, particularly in drilled passages.

The object of an engine oil filter is to remove as many as possible of the solid particles which are likely to cause wear at working surfaces. It must also prevent the passage to the bearings of sludge deposits.

It is important to distinguish between what should be stopped and what may be allowed to pass through a filter. In fact, it is possible for a filter to be too efficient. If it is too fine, all solids, including very small particles, may be trapped, but the filter will soon become choked and very frequent changes of the element will be needed. On the other hand, a filter which allows quite large solids to pass may need very infrequent changing of the element, but will not safeguard the working parts of the engine.

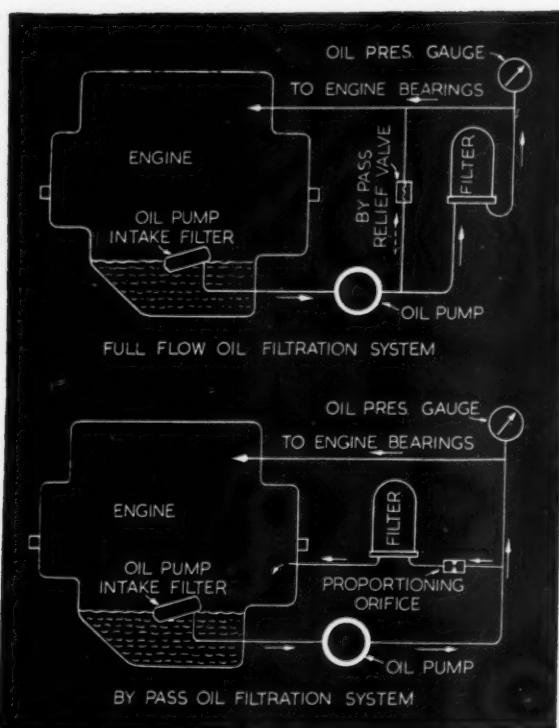
Dust (silica) and metal particles are the main causes of scoring and wear at journals, but even these may be allowed to pass a filter if they are sufficiently small not to bridge the oil film between bearing and shaft when the engine is running.

The minimum oil film thickness at main and big end journal bearings can be as low as 0.0002-0.0004 in, and solid particles smaller than this may pass freely with the oil through the bearing without harm. Particle sizes are usually given in microns (1 micron = 0.001 mm). Therefore, 0.001 in (1 thou) = 25.4 microns. From this it would seem that protection of the bearing from particles down to 5-10 microns is required to ensure that the gap is not bridged.

In practice, bearings are not quite so critical as this in their requirements, because of the embeddability of their relatively soft metal, which allows particles to sink into the surface and still remain clear of the rotating shaft. Even smaller oil-film thicknesses exist between piston rings and cylinder walls so that, theoretically, still finer filtration should be provided to prevent wear at these surfaces. However, the walls are directly contaminated from the inhaled dust in the cylinders and it is not a practical proposition to use an oil filter to meet these requirements.

Two types of filters are fitted in car engines—full flow and partial flow. As the name implies, a full-flow filter receives

OIL FILTRATION...



Full-flow and by-pass systems of oil filtration shown diagrammatically

small size, since the flow rate is low. There is an initial saving in cost with this smaller by-pass filter, but it becomes choked and ready for changing at more frequent intervals — about 6,000 miles compared with about 10,000 miles for the full-flow filter with felt element.

Several expendable by-pass filters are made in which the complete filter — element and casing — are thrown away when a replacement is required. The casing consists of two steel pressings, which are spun together so that the element cannot be

removed. Fixing to the crankcase is by a single threaded stem, which enables the filter to be screwed up against a joint face.

There is a strong case for the full-flow filter, which gives complete protection to the bearings at all times. There is always the possibility, with the by-pass type, of dirt circulating through the bearings before entering the filter.

Full-flow filters which extract the majority of particles larger than 25 microns are generally considered acceptable for car engines. By-pass filters, on the other hand, often remove particles larger than 10 microns and some give even finer filtration than this. It is not thought really necessary to filter out particles much below this size, and it is pretty certain that anything smaller than 5 microns will not cause engine wear.

Engine manufacturers have become more filter-conscious of recent years, but there are still isolated examples in which a filter which is smaller than necessary is specified, in the interests of low cost. Often a filter is required to be as small as possible, to facilitate fitting in a confined space under the bonnet, and it is

not always in the most accessible position for renewal of the element. Quite often it is a case of out of sight, out of mind, and the filter tends to be neglected, the more so the longer the car is in use.

Regular changing of the element at intervals specified by the manufacturer is essential. If it is not changed, the deposits build up until the element is completely choked and no more filtering takes place. In the full-flow filter, oil supply to the bearings is maintained by a valve which opens when the pressure differential across the filter element exceeds a certain figure, whereupon the oil enters and leaves the filter casing without passing through the element. When the element in a by-pass filter becomes choked, it merely stops the flow through that part of the system, and all the oil circulates in an unfiltered condition.

The unfortunate results of continuing to run on unfiltered oil are, unhappily, not discovered until very much later when, perhaps, high oil consumption and engine roughness give evidence of premature wear. Another purpose is served by the valve in the full-flow filter, and that is to ensure unrestricted flow of oil to the bearings when the oil is cold and highly viscous. In these circumstances, the filter element will offer excessive resistance to flow, and the valve lifts to prevent this. Fortunately, the rate of flow is low when the oil is cold, and therefore a comparatively small amount of unfiltered oil reaches the bearings before normal running temperatures are reached.

On certain cars, the main engine oil pressure relief valve, which governs the oil pressure in the lubrication system, is to be found also in the filter body, and this has been done at the request of the engine manufacturers in order to place the valve in a relatively accessible position.

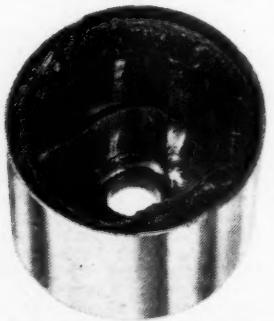
Felt is still the most important filtering medium, though paper is coming into greater use. Neither type of element should be cleaned when the time comes for inspection — instead a replacement element is fitted. Cleaning a felt element could produce shredding if it was roughly handled, and a cleaning fluid could carry the outlet side of both felt and paper elements impurities which would pass directly to the bearings when the engine

the total output from the engine-driven pump, the oil then passing direct to the main oil gallery, thence to the main bearings and big-end bearings. An auxiliary feed is also taken to the valve gear in the cylinder head.

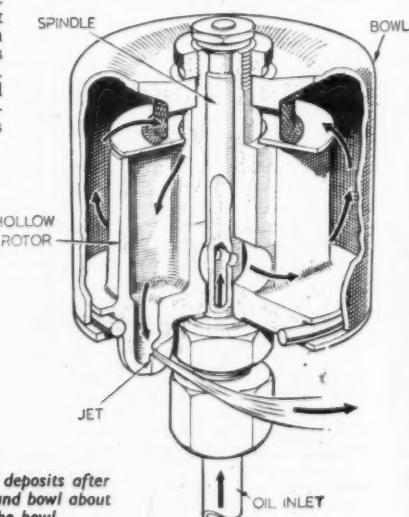
The oil pump itself is usually protected by a gauze filter at the pump intake, which floats on the oil in the sump and prevents larger solids, which sink to the bottom, from being drawn in.

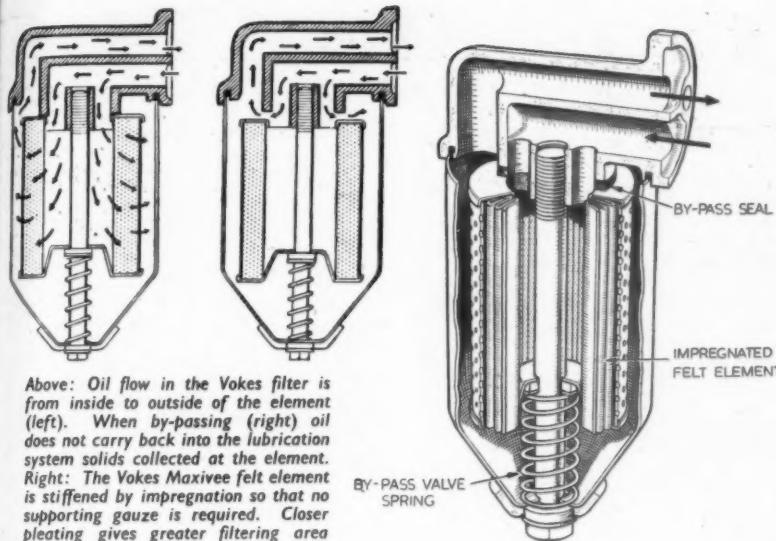
In the full-flow filter system, therefore, all the oil on its way to the bearings is filtered. The alternative arrangement is to have a filter which, although receiving its flow directly from the oil pump, is situated in a by-pass circuit, as shown in the accompanying diagram. Oil flows directly to the engine bearings, but a proportion is tapped off, usually about 5-10 per cent, and passes through the filter before returning to the sump. A restrictor ensures that no more than this amount is passed to the filter.

With this arrangement, it takes considerably longer for all the oil to be filtered, but very fine filtration can be carried out, and the filter may be of



Above: Bowl and rotor of the Glacier GFO centrifugal by-pass filter, separated to show sludge deposits after 1,600 miles' running. Right: In the Glacier centrifugal filter, a pair of oil jets rotate the rotor and bowl about a fixed spindle. The oil circulates as shown, and solids are deposited on the inside of the bowl





Above: Oil flow in the Vokes filter is from inside to outside of the element (left). When bypassing (right) oil does not carry back into the lubrication system solids collected at the element. Right: The Vokes Maxivee felt element is stiffened by impregnation so that no supporting gauze is required. Closer pleating gives greater filtering area

was started. Paper is an effective filtering medium, and in the form used in filters it is impregnated with resins to increase its strength so that it requires no reinforcement.

Felt and paper elements in a full-flow filter behave differently, as shown by the accompanying curves based on laboratory tests carried out by Tecalemit. As the solid impurities, represented by the percentage that is insoluble in petroleum ether, build up in the oil and collect at the element, paper shows no pressure drop until the 4,000-mile stage. After this it rises rapidly, and an element change is needed before the 6,000-mile mark is reached. Pressure drop with the felt element begins almost at once, rising gradually at first and then more steeply, but not attaining the same maximum as the paper element until 10,000 miles, when the felt element must be replaced.

There are also instances of impregnation of the paper with chemicals which encourage carbon particles to coagulate, so that they are more easily arrested by the filter. This tends to give the oil a transparent, clean appearance, which, however, does not necessarily reflect the true state of the oil. To understand this, it is important to realize the effect of

chemical additives which are present in many modern oils. One of these additives is a detergent, whose function is to disperse the carbon in the lubrication system and prevent it from collecting as sludge. This is done by suspending it in very small particles in the oil. Such particles are under 5 microns in size and, being soft, cause no damage as they circulate through the engine. This gives the oil a dirty appearance, although in fact it may be free from harmful solids, so that the colour of the oil on the dipstick is no guide to its condition. It is quite unnecessary to filter these carbon particles, for as long as they circulate in this form they are harmless and will be removed at the next oil change.

A recent development of interest in the field of filtration is the centrifugal filter. A design has been developed for car engines by the Glacier Metal Company, and this consists of a bowl attached to a rotor which revolves on a spindle at speeds up to 9,000 r.p.m. Oil is fed under pressure from the lubrication system to the centre of the spindle and enters the bowl, where it is rotated, dirt present in the oil being subjected to a force of 1,500 times the force of gravity at this speed. Dirt is separated from the oil and collects in the

bowl, where the capacity is 10 cu in.

The oil itself drives the filter by means of a pair of tangentially placed jets through which the oil leaves the bowl, the reaction at these jets providing the force to drive it. It is designed to be mounted in the mouth of a suitably enlarged oil filler, so that it needs no cover to retain the oil. A supply pipe is the only connection required. The main advantage, of course, is that there is no element to be changed at intervals, but instead the bowl is detached and the deposits removed from its inner surface. A prototype about 3in in diameter, fitted to a Humber Snipe which had no other oil filter at the time, collected 3oz of dirt—a deposit $\frac{1}{8}$ in thick inside the bowl—in 1,600 miles, which gives an idea of its effectiveness. This is a development of existing centrifugal filters for commercial vehicle and industrial engines, and it is planned to go into production with it for private car engines. It cannot be heard while the engine is running, although a slight hum may just be detected as it runs down after the engine has been stopped. In Italy, Fiat use a centrifugal filter, which is incorporated in the crank-shaft pulley of the 500 model.

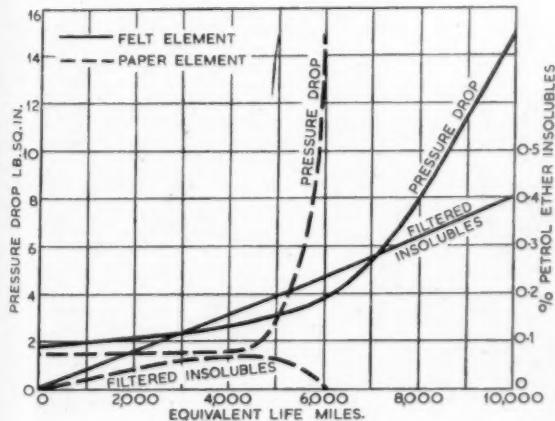
A consideration which applies to all filters dealt with is their effect on additives such as colloidal graphite and molybdenum disulphide. These substances, when obtained from reputable manufacturers, are carefully controlled as to particle size, and these are not prevented from passing through any of the filters, whether of the full-flow or partial-flow type. An exception is the centrifugal filter which does separate out a small proportion of these solids, but their effectiveness during the running-in period is not impaired.

An efficient air intake filter is complementary to oil filtration, and becomes of first importance in very dusty conditions, where otherwise heavy cylinder wear would occur. A filter must also be fitted at the crankcase breather opening, and this is often combined with the oil filler cap. However, neither can remove the finer dust particles, unless the filter area is very large (as in the Vokes torpedo-shaped carburettor air intake cleaner with felt element), since the total area of the element must be great enough to prevent excessive restriction to airflow.

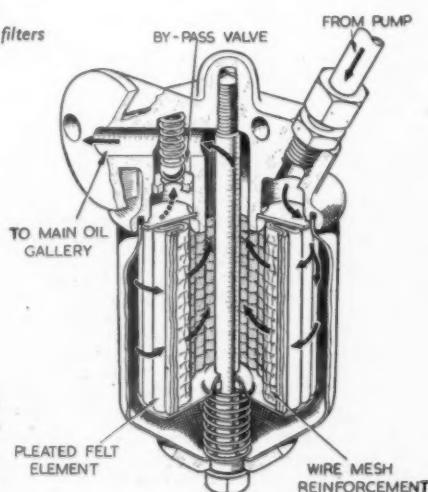
In the last resort, therefore, it is the lubrication filter which must perform the vital task of ensuring a clean supply of oil to the engine bearings.

D. M. P.

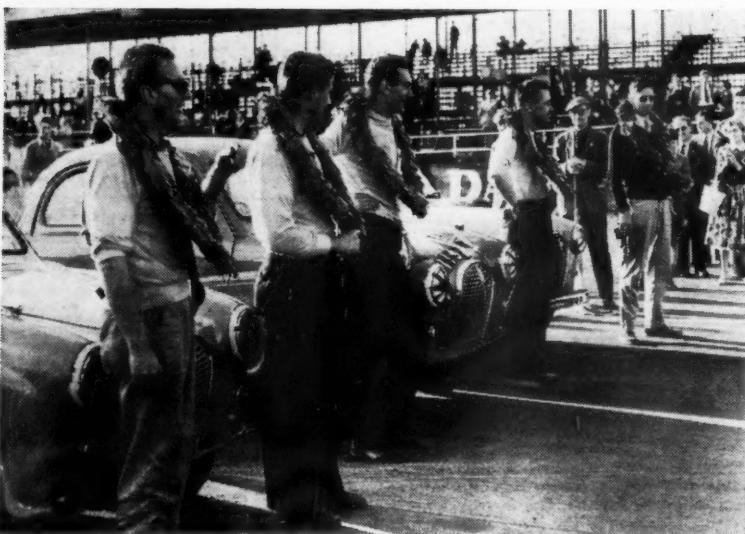
Based on laboratory tests, these curves compare the performances of equivalent full-flow filters having felt and paper elements



Sectioned Tecalemit full-flow filter—this model is used on the B.M.C. A series engines. The outlet matches up with a drilled oil passage in the crankcase



Perpetua Mobile



Six hours' hard labour—then laurels for the Speedwell Austin team. Left to right are Len Adams, Graham Hill, John Sprinzel, George Hulbert, and team manager Lutz Arnstein

NOW the longest annual motor race in the British calendar, this year's 750 M.C. National Six-Hour Relay Race was more than ever a "wow." Horse-collared in hard-earned victory laurels were John Sprinzel, Graham Hill and Len Adams, after pounding their little Austin A.35s round and around the extended Club Circuit at Silverstone with relentless fury. Their victory was attributable also in part to reliable and well-prepared cars (with a Brazilian, two Jamaicans, an Indian, a Chinese, an American and a semi-Swede in attendance), as well as very slick change-overs of cars and drivers at wide intervals.

It was, too, a moral victory for the handicapper, Charles Bulmer, without whose uncanny wizardry this race would lose much of its charm and fascination. He had to contend with 21 teams, each comprising from three to six cars and drivers, the vehicles ranging from full-blooded Climax-engined Lotuses and C-type Jaguars to some rather anaemic-looking, home-made Austin specials—several of the latter a cruel challenge to philanthropic and conscientious scrutineers. Fine weather prevailed throughout, but no doubt Bulmer's calculations would have worked equally well in the wet.

As in previous years, all except three scratch teams received credit laps up to a maximum of 34 for the 2½-mile circuit, which included a hairpin loop along the runway from Maggots to Club and back to Woodcote, via a very fast double left-hander at Tower. Sash-swapping took place at the normal pits—this area being marked off with oil drums and vigorously yellow-flagged by marshals—and the team managers were free to decide whom to send out when, and for how long.

Every second counts, and the Porsche's roof opens much quicker than its windows. Denis Jenkinson hands over the sash following an afternoon spin

All repair work (including, as usual, the occasional complete engine change) was performed in the paddock area behind the pits. There was a foot-sprint Le Mans-type start (bad, because it handicaps those who wear safety belts) when John Sprinzel's long legs carried him first across the track and away; but the leading car round on lap one was Cox's Elva III (scratch, Lancashire and Cheshire C.C.), followed by Tyre's C-type (Jaguar Drivers Club, which had lost one of its team cars when Peter Mould's Cooper Jaguar suffered a monumental blow-up during practice) and Allen's Lotus XI (Mixed Climax team). Grace's rod-hot Riley 1500 kept the ambulance men with fingers on their starter buttons, and before long came in with a very buckled wheel.

The team of Jowett Jupiters included the only three R.4s ever made—the third apparently assembled from parts since the firm ceased production. One of these cars lost a wheel and hub during practice, but was made good in time to race.

SPEEDWELL A.35s

WIN 750 CLUB'S SIX-HOUR RELAY

In the first half-hour, several cars pulled into their pits for divers reasons, and the joint leaders at that time were the 1,172 Formula team and the Tortoise stable Lotus drivers, the interim placings during the race including an appropriate portion of handicap allowance.

After one hour John Sprinzel was still wheeling round smoking a cigarette, Escott's scratch Lotus had replaced the Elva and shared the lead with Tyre's scratch Jaguar (the car in which Moss finished second at Le Mans in 1953), and the Ford Powermaster saloons with Willment inlet-over-exhaust conversions; this last équipe eventually expired with all hands, the only team not represented at the finishing line.

The Fords' handicap, incidentally, allowed them 24 seconds per lap more than the Jaguars, but Tyre was gaining an extra six on this. Then one of his rear tyres began to disintegrate and he was replaced by Sargent in another C-type. At 2.30 Bloor's Lotus, which only 15 minutes earlier had replaced Escott's, ceased fire at Club, and Dodd, in another Lotus, went off to relieve him—too many stops and changes for victory.

After 1½ hours Sprinzel came in for a rest and Adams took over. Half an hour later, at 3 p.m., the Jaguar team led from the Austins, a mixed team entitled "Healeys and Friends" and the West Hants and Dorset M.C.'s MGAs jointly in second place. But the little Austins were gaining 3 to 4 seconds per lap on the Jaguars, so that by 3.30 they had slipped by into the lead; fifth lay the Chiltern C.C.'s TR2s and TR3s.

The pits were a constant riot of motley signals—21 team managers and their staffs waving banners with lap times and less recognizable instructions. A Healey flashed by with straw ignominiously entangled in its rear bumper. Clearly there were doubts as to which side A should overtake B, and once, just before Copse, A passed B on the right, and almost simultaneously C passed B on the left.



and A on the right—yet they all survived. Right from the start it was clear that the two MGA teams (W.H. and D. M.C., and M.G. C.C.), each with 20 laps credit, were very evenly matched, and for much of the race were on the same lap. *Barba Rossa* (to the Italians) Denis Jenkinson, *Motor Sport's* continental correspondent, now took over the Porsche colours for a spell in his left-hand-drive hack with over 120,000 miles behind it. In practice he had lapped in 2min 6sec, and his car was especially remarkable for its quiet running. Once or twice he toiled in the grass at Woodcote before taking a gentle spin there, but the car was still fit to leave for Portugal the next day.

More serious was the slow roll at Club by Thomas' R4 Jupiter, after its bonnet had blown open and obscured his vision. At first he was reported as having a slight leg injury, later there was a broadcast request for the loan of a stick—the injury was only a cut and bruises.

At 3.30 Graham Hill took over from Adams for the leading team, and by half-time (4 p.m.) the Austins still led, now closely pursued by Peter Morgan's team of Plus Fours about half a mile astern. Austin lap times varied between Graham Hill's fastest in 2min 14.6sec and about 2 min 18sec. Meanwhile Hale's M.G. A (M.G. C.C.) retired suddenly with phenomenal rumblings abdominal, and Chris Tooley, next in line, lost precious time putting on his crash helmet before taking over. With two hours to go the Morgans held temporary mastery over the Austins, the M.G. Club had moved up to third place, and the scratch Innes Ireland team lay fourth.

At 5.15, after 1½ hours' run, Dick Stoop's Sebring Frazer Nash (Frazer Nash team) broke a front stub axle at Tower, where he was lucky to have sufficient space for a rather damaging crash stop. Stoop then ran most of the way to his pit with the all-important sash, although had he known in time the next driver could have motored round and picked it up.

Seconds now became more and more valuable in change-over pit stops, the Speedwell Austins losing only six seconds on one, as compared with the Morgan drivers' 11. At 6.15 (45 minutes to go), Peter Morgan handed over to Mayman, and the Austin team rejoiced at their rivals' delay, but six minutes later Hill suddenly rushed in to retire with a spent clutch and Adams took over. The margin between these leading teams was very close and the two MGA teams still were fighting desperately for third place, the W.H. and D.M.C. car in the lead by about 150 yards.

At 6.37 the Morgan pulled in to have its bonnet fastened, but after a further lap it returned again with the same trouble. The replacement car's driver was surprised with helmet and gloves off, which seriously thinned their chances of victory. Meantime Noble and Tooley weaved in and out of the heavy traffic, took to grass in line ahead at Woodcote and, with the cars so evenly matched, it became a real drivers' battle.

With only 6½ minutes to go one of the surviving R4 Jupiters disappeared through a fence near Woodcote, the driver in due time strolling back to his pit with the sash. Tooley and Noble now passed the pits side by side; with two minutes to go Tooley trailed Noble into Copse, then Noble spun off and spent at least 15 all-important seconds in recovering, so it was Tooley after all who took second place to Adams' Austin past Holland Birkett's chequered flag.



In one of three R4 Jowett Jupiters which had a rather costly day is Miss E. A. Neale, the only woman competitor, who drove fast, consistently and without incident

Behind these first three finishers (credited with 187, 186 and 185 completed laps respectively) came five teams in close succession on their 184th lap, these latter including two scratch teams, and three more were on their 183rd—a miracle of handicapping for such a field.

Throughout the race there was an extremely able and well-informed commentary by Nevil Lloyd and Colonel Bassett, who seemed to notice everything that happened almost before anyone else, which is quite a change for these days.

Although some fairly professional teams now take part in this Relay, it is still mostly a party for amateur enthusiasts. There is no prize money—only *kudos* to be gained—but this seems a splendid opportunity for embryo racing drivers to

gain extensive experience among a lot of other cars on a race track. Already we are looking forward to next year's race.

PROVISIONAL RESULTS

1. Speedwell Stable: Austin A.35s 948 c.c. (J. Sprinzel, G. Hill, L. Adams). 187 credit laps completed. 2. Morgan Plus Four Team: Morgans 1,991 c.c. (P. H. G. Morgan, R. E. Meredith, L. Mayman, P. Mayman, A. G. W. Belcher). 15 credit laps, 186 laps completed. 3. M.G. C.C. Team: M.G. 1,489 c.c. (G. Tooley, J. Hayles, G. Cobban, G. Shove). 20 credit laps, 185 laps completed. 4. Octagon Stable (West Hants and Dorset M.C.) MGAs 1,489 c.c. (G. N. Dear, J. M. Noble, M. J. Reid). 20 credit laps, 184 laps completed. 5. Innes Ireland Stable: Lotus XI Climax 1,098 c.c. (C. Mortimer, G. Orman, P. Heath, P. Mansfield, Dawson). 0 credit laps, 184 laps completed. 6. Alfa-Bristol Team: Lister Bristol 1,971 c.c. (J. Randles), A.C. Ace 1,971 (G. R. Green), A.C. Ace 1,971 (E. Howard), Aston Martin DB5 2,922 (E. Portman). 6 credit laps, 184 laps completed.

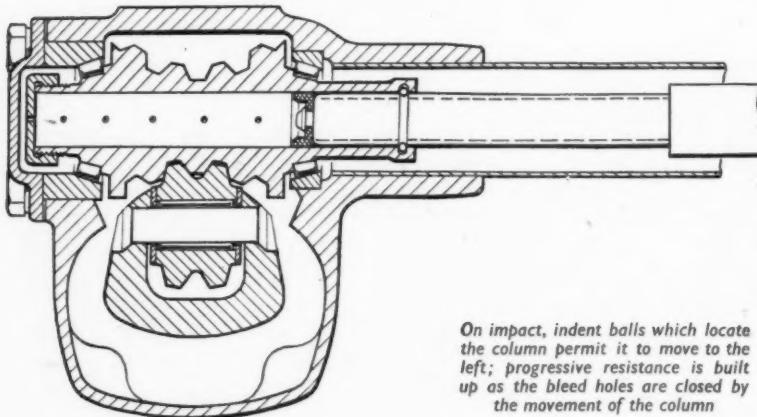
7. M.B. Shield (First 750 Formula Team): London A Team: Austin 747 c.c. specials (R. Lee, R. Spence, W. Owen-Roberts, J. Wilks, J. B. Moore). 34 credit laps, 182 laps completed.



Above: Budding Fangios at Club: G. Morgan (Consul-engined Lotus VI, Tortoise Stable) leads Hamish Orr-Ewing's Le Mans Frazer Nash. Below: Member R. Lee's L.R.M., of the 750 Formula London A team which won the 750 Challenge Shield, leads S. M. Noble's MGA of the West Hants and Dorset team—fourth past the chequered flag



TECHNICAL TOPICS



On impact, indent balls which locate the column permit it to move to the left; progressive resistance is built up as the bleed holes are closed by the movement of the column

INTERNAL SAFETY

An Experimental Shock-absorbing Steering Column

EVERYONE, motorist or non-motorist, is aware of the increase in road casualties, but it is not so widely appreciated that in terms of road miles per vehicle there is a steady improvement.

In other words, although the casualty rate has increased, the number of vehicles and the mileage which they cover have grown at a much greater rate. Insufficient credit is given to manufacturers for the part they have played in improving safety. Precision of steering, brakes and roadholding on the average family saloon have undergone most noticeable improvements.

Inside the car there are still too many projecting sharp-edged corners which can cause damage to the occupants in the event of a collision. During last winter, when visiting the Volvo factory in Sweden, I was impressed by the number of cars on the roads which had shoulder-strap safety harnesses. There is no compulsion in the use of these, but it appears that about 70 per cent of drivers have adopted them in that country, particularly for use during the six winter months when the roads are covered with packed snow.

Analysis of accident reports indicates that passengers may suffer worst injury as the result of being thrown forward during violent braking, or on impact with obstacles and other vehicles. This, of course, is the reason for the provision on a number of cars of resilient rolls on the top and bottom edges of the facia, and, mainly in America, of dished steering wheels to prevent the hub centre injuring the driver's chest.

In general, insufficient thought is still given to the design of items with safety in mind. Spearlike mountings for rear-view mirrors and clocks with external adjustment knobs, placed above the screen rail where they would be likely to be dangerous at the slightest impact, are far too common.

American Investigation

In 1948 an American investigating team recommended that a steering column arranged to telescope at high-impact loads would make a noticeable contribution to the reduction of driver's injuries in head-on collisions.

It was with considerable interest that I read a recent report by Porsche, based on their own studies and observations. As a result of these, they have developed a resilient hydraulically damped steering column, which has been tested out on their own works cars.

Investigations have shown that in the event of a collision, the greatest degree of safety is achieved when the steering wheel hub is as far away as possible from the driver's chest. A steering wheel is used not only for turning the front wheels—the driver finds it valuable as a steady when applying the brakes, and he pulls on it when accelerating rapidly; consequently it must be fixed in the most convenient position for fulfilling these three functions.

It is only in the event of a collision, when much stronger forces act on the steering wheel than those encountered during ordinary driving, that the steering wheel should give.

Thus it is necessary to arrange for the hub to move away from the driver at a predetermined load. Moreover, it is also important that the steering-wheel column should not telescope rapidly; if it did, the impact of the driver on the hub would take place with more or less the same force, although a little later. If the steering column meets with a certain amount of resistance when telescoping, i.e., if it is damped, the impact of the collision is reduced, and the driver is given some protection against high deceleration forces.

The safety column developed by Porsche incorporates a sliding, telescopic damper inside the worm-gear of the steer-

ing box. At the lower end of the worm the inside diameter is formed as a cylinder enclosed with a cap, having a single bleed hole; in addition, there are five more bleed holes in the cylindrical portion. Working in this cylinder is a synthetic rubber piston attached to the end of the steering column, which is provided with sliding splines to give longitudinal freedom.

Indent balls on the splined portion locate the column in its normal position, and they are designed to prevent axial movement unless the applied load exceeds 200 lb—about twice that applied to a brake pedal in making an emergency stop.

The end movement of the steering column is between 2 in and 2½ in. Once the break load has been exceeded, the first impact is taken up gently, because initially there are six bleed holes through which the oil (the normal lubricant used for the steering gear) is forced. As the steering column is pushed farther in, the resistance builds up as the number of bleed holes diminish, until finally the remaining oil is forced through the last hole in the end cover. Thus, not only is the force greater, but also the damping—the effect is exactly like that of a suspension damper, which offers little resistance to small bumps but has an increasing resistance to absorb the large ones.

There are no immediate plans for incorporating this safety provision in production cars, but it is such an obvious and comparatively cheap device that it will be surprising if it is not widely adopted in the near future.

Safety and Adhesion

In this week's leader, attention has been drawn once more to the problem of tyre adhesion, for it is a factor which, probably more than any other, contributes to accidents. For some time, we have noticed a deterioration of wheel adhesion, and have attempted to analyse the causes; our conclusions are that road surfaces are more at fault than any particular make of tyre or design of tread.

The problem is very complex, for whereas the tyre manufacturers can develop a particular rubber mix and tread pattern which will give satisfactory adhesion for a known type of surface, they cannot produce a universal answer for every type. Moreover, the problem of wear rate must also be reconciled. Race-goers are often astounded by the speeds which racing cars achieve on wet tracks, but they would be very dissatisfied if at the expense of improved adhesion for their family cars they found it necessary to replace tyres every thousand miles.

It is perhaps ironical that the one component which plays a greater part than any other in roadholding cannot be designed to suit a particular vehicle. In other words, whereas steering and suspension layouts, springs and dampers can be designed to specific requirements, the tyre, which is the ultimate link with the road surface, is a universal fitting and, as such, must be something in the nature of a compromise.

A final opinion on the question of road surfaces: I have studied the Road Research Laboratory reports on the work which they have carried out on this subject, and cannot support all their findings. In my experience the best adhesion is obtained from the old-fashioned tarred surface covered with granite chippings—and I should be very surprised if it is not the cheapest of all. But this is rather outside my field.

H. M.



DEVON scene at Kingsbridge, at the head of a delightful estuary, with Salcombe lying at its seaward end

Correspondence

Highway Code

Obey or Disobey? Mr. Murray-Brown's questions on the Highway Code (1 August) remind me of another. What regulation can be obeyed only by breaking one?

Answer: Page 30, C.U.R. No. 19. Before driving, make sure that your horn is in working order.

Page 31, C.U.R. No. 84. You must not sound your horn while stationary.

It is, of course, impossible to test a horn without sounding it.
Newcastle-on-Tyne.

C. HOWARD MORTON.

Peter Collins

Need for Drastic Changes. It was with great sorrow that I learned of the death of Peter Collins. I can only hope that his sacrifice, and those of all the many fine drivers who have been killed recently, will speed up drastic changes in Grand Prix and sports car racing. Manufacturers and racing organizers take for granted the apparent infallibility of the drivers, forgetting that drivers are human and can make mistakes—and mistakes at high speed are fatal. Either the courses must be highly modified or better still, eliminate all "racing" cars and race standard production models only.

Belfast, Northern Ireland.

R. ROSSI.

Money Well Spent

150,000 Miles in a Bentley. Shortly after the war, like so many others I found it necessary to buy a car, and I had a strong urge to buy a British car and not the usual American. As I have a fairly large family and a seaside cottage some 80 miles from Cape Town, it was necessary to have a large car

which could stand up to heavy loads and high averages on our mountainous Cape roads. My father had been one of the first owners of a motor car in South Africa, an 8-horse de Dion Bouton, 1905, and after this owned a variety of British cars, his idea being to support "the old country," and I suppose the children were imbued with the same enthusiasm.

The idea of spending approximately £3,300 on a Bentley appalled me at first, especially when it would have been possible at the time to buy a large, well-known American car for one-third of the price. To cut a long story short, sentiment prevailed, and in some trepidation I signed the order. Months later, with a feeling very much like the child stealing a peep at the Christmas tree, I ventured down to the docks at Cape Town to watch the "parcel" being off-loaded.

It was grimy and covered with strips of sticky paper, grease and the like, so first impressions were disappointing, but in a few days' time I had the enormous pleasure of driving, to my mind, the then world's best car around Table Mountain to my home. There were teething troubles at first; none of them was serious and in nearly all cases they were due to lack of local knowledge as to how the car should be serviced. Bentleys could not have been kinder or more prompt about the righting of the wrongs, and she then settled down to her 11 years (or very nearly) of hard, fast service.

I visited the United Kingdom in 1951 and had her "de-coked," spending a bit here and there on modifications and

Opinions expressed on these pages are those of our correspondents, with which The Autocar does not necessarily agree. Letters intended for publication should be addressed to the Editor, The Autocar, Dorset House, Stamford Street, London, S.E.1.

Correspondence

other items, and I then did some 7,000 miles in the United Kingdom and on the Continent without any trouble. I was very amused at a little incident in the Bentley works at Willesden when I was told that their gear box expert would like permission to take the gear box down. I told them that the gear box was perfect, but was informed that this was not the case as their expert could "hear" the third gear. When I said that I, personally, could not, I was told that I was used to the car and could not be expected to! When I found that it would cost about £30 to take the box down I was somewhat hesitant, but was informed that they would like to feel that the box would give perfect service for another 100,000 miles, and that this would be a good opportunity to get it into apple-pie order; in addition, if they were permitted to open the box they would also be able to modify it in certain respects at no cost to me! The box was duly overhauled.

After my return to South Africa I covered another 60,000 miles, bringing the total mileage up to 127,000, and then decided to take advantage of Bentley's scheme for "replacement" engines. When Bentleys supply a replacement engine it is remarkably close to being a brand-new engine, and I think they perform a wonderful service when they offer a replacement engine at the sum of £275 ex works" to overseas owners. The replacement engine arrived in a permanent form of packing case in which the old engine could be safely returned, and it included everything up to the gear box, even the plugs.

The speedometer now reads 150,000 miles. The car has been resprayed and behaves just as it did nearly 11 years ago, and the gear box, though I can "hear" it sometimes, is still substantially more silent than that of most contemporary cars. This car's general performance compares very closely with that of contemporary makes, though the up-to-date American vee-8 is now a little faster and is somewhat quicker off the mark.

The car has many unique features, two of the most important being that performance varies little with the miles (maximum performance now, just on 100 m.p.h., is the same as it was when the new replacement engine was put in 23,000 miles back), and on long journeys, despite high averages, petrol consumption continues at just on 18 m.p.g. As to the brakes, they have been relied at 50,000-mile intervals, and they are, I think, still as good as—if not better than—any on the road for accuracy, reliability and power.

Looking at it strictly from a financial point of view and after taking into account the price obtainable for the car today, depreciation compares very favourably with that on many cheaper cars. Reliability is, of course, superior to all. My purchase was definitely a case of money well spent, but there is more to it than that. I and my family have had a vast amount of pleasure out of motoring for 11 years, and we have an old friend in the family which we cannot look upon as a piece of machinery. There is something else about a Rolls-Royce or Bentley—it epitomizes the honesty and craftsmanship in British engineering.

Cape Town, South Africa.

A. J. A. S.

Learn As You Go

Value of Running Commentary. May I say how glad I was to read the advice under the heading "Learn as you go" (8 August) to drivers to practise short periods of running commentary as they drive; I have found this to be a great help, and often do it when driving alone for long distances: it keeps up one's concentration in the most efficient way, and I fully endorse your very excellent advice.

Tewkesbury, Gloucestershire. W. HOPPER SHEPHERD (Dr.).

Three Speeds or Four?

Comparative Experiences of A.95 and Zephyr. Referring to correspondence on the relative merits of the useful performance of Austin A.95 and Zephyr II, I have had considerable experience of both, and find little to choose between them. In standard form with column change, my A.95 has nothing on the Zephyr II, as power comes in much higher up on the A.95. Most of these cars have a bad flat spot, and the column change is clumsy and slow; the steering, too, on the A.95 seems to be much less precise than that of the Zephyr, especially on an adverse camber. This is possibly due to the softer front springs on the A.95, and its narrower track. There is very considerable spring in the steering mechanism on the A.95, particularly the box mounting brackets and the like. I find the visibility better on the Zephyr. With floor change and a larger compensator jet, however, I think that the A.95 has the edge on the Zephyr, but again one has to use the gear lever, as there is no point in

holding third speed above 45 or 50 m.p.h., and a change to top gives better acceleration. I now have twin S.U. carburettors on my A.95, with non-standard needles, and this gives me really good acceleration from 30 to 50 m.p.h. in third, but it is generally better to change into top fairly early. A necessity with increased performance is firm braking, and the A.95 is very good here, especially as the Zephyr tends to judder under hard braking, and sometimes is not happy if braked hard when not running straight ahead.

If anyone has experience of modifications to the A.95 steering—for example, stiffer box and idler-arm mounting brackets—and also any slightly smaller steering wheel made in one piece, I should like to hear from them. Under fairly hard driving the current A.95 wheel, with the spokes and ring bolted to the boss, persists in working loose, and is a very poor article.

My own conclusion is that if you like a "sporty" drive take an Austin A.95, floor lever and larger compensator; if a more comfortable and lighter ride, choose a Zephyr. The time taken will be about the same with each car.

Parkstone, Dorset.

PHILIP B. JONES.

Exhaust Resonance

Plea from a Magnette Owner. Can any Magnette owner tell me how to cure a very unwelcome exhaust resonance in a nearly new M.G. Magnette? The silencer has twice been replaced and the tailpipe once, but the crackle is still there, practically unchanged. Would a small auxiliary silencer be the answer?

Ashtead, Surrey.

[Letters will be forwarded.—ED.]

D. MURRAY.

Thermostats

What is True Working Temperature? In "News and Views" (13 June) you point out that American motor manufacturers are to use in future 180 deg F opening thermostats in place of 160 deg F opening type. The final sentence of the paragraph indicates that you are under the impression that English manufacturers use low opening temperature thermostats.

British manufacturers have been using thermostats whose crack-open temperature is 176 deg F since, at the latest, 1951. The normal thermostat used in this country—the bellows type—is pressure sensitive in that its crack-open temperature is retarded about 3 deg F for every 1 lb sq in rise in pressure. Thus, with a 7 lb sq in release pressure, as most British cars have today, the opening temperature will be delayed by 21 deg F—the engine's normal running temperature will be about 197 deg F.

Whilst the boiling temperature on a vehicle with a 7 lb sq in cup is retarded to about 233 deg F a normal running temperature of 197 deg F is by no means cool as I am sure you will agree.

Ilford, Essex.

D. G. K. ABERNETHY.

[Our experience does not confirm this. Most British cars seem to have an operating temperature of 70 to 75 deg C (158 to 167 deg F) which we consider to be too low. A main manufacturer of thermostats states that 74 deg C (165 deg F) is most commonly specified for British cars. For winter use, a replacement thermostat set at 84-86 deg C (183-187 deg F) is recommended.—ED.]

Road Signs

Inconsistencies on A45. Coming round a bend in A45 (Birmingham—Cambridge—Felixstowe) recently, I was confronted by an enormous notice which sternly proclaimed "Lane Lines." Since it did not order me to "Observe Lane Lines" I could only assume that it was there to tell me that there *were* lane lines; but there weren't! Only a single innocuous dotted line ran down the centre of the road, as before.

Farther along, another gigantic instruction told me of a "Hazard Ahead," and after negotiating a gentle left-hand bend which I had seen from about a mile away, I looked in vain for the expected hairpin bend or 1-in-4 hill.

Later on I came up behind a lorry at the start of a long sweeping right-hand (to me) curve, around which the whole of the empty road was clearly visible. "Aha!" I thought, "Ideal for overtaking. Let's go!" But no—yet another notice shrieked at me "Do Not Overtake." Obedient to the last, I did not overtake. This curve was followed by a similar left-hand curve, where I was assaulted by the words "You May Overtake." But I couldn't—I would have been quite blind to oncoming traffic until I had got at least halfway past the lorry. So I stayed behind the lorry, cursing quietly the light-hearted fantasy of these new signs. Fortunately matters were reversed a short way farther on, and I was allowed to pass on a right-handed curve, showing that the signs are not even consistent.

All this on a narrow road only two lanes wide; these signs may be fine on three-, four- or six-lane roads, but on our usual two-lane roads they are a sheer waste of time and money. Allowing some very minute use for the hazard and overtaking

signs, the ten lane lines signs I saw probably cost upwards of £350, which would pay for one lay-by (horrible word!), of far more value in road safety.

Regarding the signs themselves, why on earth do they all have to have a bend in the bit of road depicted?—the bend is not even always in the right direction. In the overtaking signs, half of a car is shown in the bottom left-hand of the picture, coloured red or blue (why blue and not green?) dependent on whether overtaking is allowed or not. But the half-car (why only half?) is not overtaking anything, merely proceeding sedately on its own side of the road. A foreigner seeing a red car in the picture, and thinking of his own far better signs, could be forgiven for thinking he was in error in being on the road at all.

W. BLANCHARD.
Hingham, Norfolk.

Used Cars on the Road

In Defence of the Lea-Francis. I cannot allow to pass unchallenged the comments on 14 h.p. Lea-Francis cars in general expressed in the latest "Used Cars on the Road" (18 July). The defects of one particular car must not be allowed to mask the many virtues of a fine vehicle which is both roomy and economical. I have owned a similar model for the past two years and stoutly reject any idea that it is cumbersome to drive and hard work to stop. The steering can be described as heavy only at very low speeds, but this is hardly exceptional.

As to performance, it should suffice to say that I am seldom overtaken, and I don't drive with a heavy right foot either. My co-driver wife, who is no Amazon, finds the Lea-Francis equally pleasant. The front suspension is a happy medium between pre-war leaf springs and modern soggy coils. It is certainly softer than contemporary Riley torsion bars, and is

quite capable of dealing with any English road surface without discomfort.

Finally, the quoted petrol consumption of 19-22 m.p.g. is appallingly pessimistic. On short journeys for shopping, children to school, and so on, the figure is around 25 m.p.g., and on long runs cruising at about 50-55 m.p.h. I obtain a consistent 30 m.p.g. The S.U. carburettor is fitted with the standard needle.

Yeovilton, Somerset.

D. E. PARKER.

Nylon v Rayon

New Development in Tyre Carcasses. "Detroit Notebook" (18 July) referred to the "battle between nylon and rayon for the American tyre cord market . . ." and particularly to the Chevrolet decision to drop the idea of nylon tyres since ". . . price was still the bug." It is true that price influenced this decision, but a major factor was, no doubt, the emergence of a new rayon yarn of greatly increased strength, which has nylon licked on a cost-strength basis. This new yarn allows manufacturers to make tyres appreciably stronger than nylon for the same cost or, alternatively, equally strong at lower cost.

In addition, such rayon tyres have proved mileage superiority of up to 26 per cent better high speed performance, equal safety and impact resistance, and give a more comfortable and quieter ride. These results from independent tests have just been published in U.S.A. and, coupled with the lower cost, give good grounds for Chevrolet's decision. The new yarn is now in commercial production in the U.K., Canada and the U.S.A. In addition to its outstanding technical properties it is the most economical tyre cord that has yet been offered to the tyre industry.

M. I. DAVISON.
(Courtaulds, Ltd.)

SELLING

On-the-spot Analysis. It is difficult for readers living abroad to enter into correspondence on topical subjects; however, I would like to comment on some statistics which I think may be of interest, taken from an independent magazine called *East African Trade and Industry* for May, 1958, giving details of vehicles sold in Kenya.

MOTOR CARS					
Make	Total for 1957	Quarterly Average, 1957	First Quarter, 1957	First Quarter, 1958	
Ford	1,125	281	429	421	
Volkswagen	937	234	357	247	
Morris	360	90	118	153	
Fiat	275	29	72	123	
Peugeot	271	68	82	119	
Austin	205	51	50	109	
Opel	230	57	58	91	
Simca	97	24	7	68	
Vauxhall	183	46	58	57	
Chevrolet	101	25	37	53	
Mercedes-Benz	185	46	52	51	
Standard	73	18	21	40	
Hillman	135	34	43	39	
D.K.W.	129	32	29	31	
Renault	102	25	39	26	
Total	4,408	1,100	1,452	1,628	

STATION WAGONS					
Make	Total for 1957	Quarterly Average, 1957	First Quarter, 1957	First Quarter, 1958	
Land-Rover	621	155	126	180	
Peugeot	423	106	89	147	
Ford	450	112	131	124	
Morris	374	92	96	121	
Opel	199	50	39	73	
Austin	108	27	19	71	
Chevrolet	140	35	43	67	
Volkswagen	117	29	31	38	
Holden	20	—	—	29	
Standard	71	18	24	27	
Total	2,523	624	598	877	

I am an ex-Volkswagen owner and as such am biased, but are we not all biased either for or against anything, especially cars? Just under half the total car sales for 1957 are shared by Fords and Volkswagens; this includes the whole Ford range of Zodiac, Zephyr, Consul, Prefect, Anglia, Popular, Escort and Squire, but only the one export model of the Volkswagen.

I would account for the Volkswagen sales in the following manner—they have excellent suspension for the dirt tracks that are called roads out here and, by virtue of their suspension, are not at all tiring to drive over a long run, which out here is often of 300 miles per day or more. Possibly most important of all in East Africa are the excellent (by local standards) servicing facilities and ready availability of spare parts. These facts, coupled with the cheapness of the spares, standardized repair

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costs and a sound and very solidly built car, tend to give one as trouble-free motoring as is possible under local conditions.

The most important factor out here is that one's car should be as near 100 per cent reliable as possible, as more often than not the nearest garage is over 50 miles away over very rough roads, and one cannot be left transportless whilst agents send off by air for spares—which one then has to pay for through the nose.

Ford also have an excellent servicing organization, though one feels they do not have quite the control over their minor agents that the Volkswagen works do, and they have not introduced standardized repair costs. They also have the further appeal of a wide range of cars, suitable to all income groups from the very rich to the not so rich. All the British makes do, doubtless, benefit to a certain extent from the policy of a number of commercial concerns out here to buy and use only British products. Simca sales seem to have increased considerably in the past year, but they have only been on sale out here for a period of 2-3 years and are presumably just making a name for themselves.

In the Station Wagon class it is for obvious reasons that Land-Rovers lead the list in a country like this, but it is interesting to note that their agents here are the same agents as Volkswagen have, and one wonders whether perhaps the good servicing facilities offered don't have some bearing on the sales figures for these two makes. The Holden is, of course, a newcomer out here, but appears to be selling very satisfactorily, and another newcomer of promise is the Volvo.

As you will see from the makes listed, East Africa is virtually a free market, and all cars sell on the same terms as to import duty and the like.

The indications of the above statistics bear thought by some of our British manufacturers; the main point to be remembered is that out here we cannot afford to have the family car off the road needlessly for any length of time. Such a mishap is not an inconvenience, it is a disaster; a car out here is not a luxury but a necessity.

It is high time that manufacturers realized that if they can produce a vehicle which will stand up satisfactorily to the roughest roads and handling under everyday use, they will be catering for a large and important market and, at the same time, producing a basic vehicle of real worth.

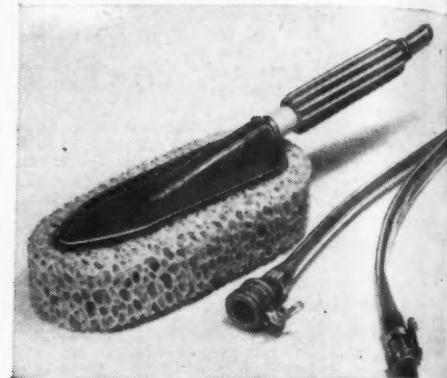
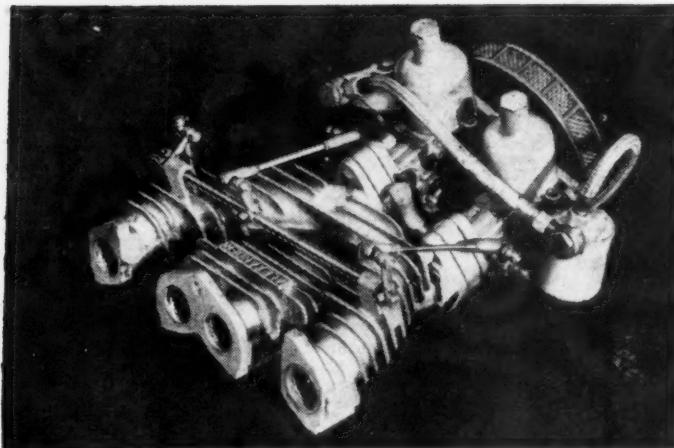
I myself motored 10,000 miles in nine months in a Volkswagen, largely on tracks in our very interesting game parks, and with never a thought for the car beyond servicing at the recommended intervals, and never had a breakdown at all of even the most minor component. To give an idea of the conditions, my initial set of Firestone Phoenic tyres had to be retreaded at only 13,000 miles, through no fault of the tyres, although possibly due to my driving and certainly due to inferior conditions.

Finally, a quirk of my own—could we not have less chrome, as every bit of chrome ornamentation is a built-in rattle, and very often not at all necessary.

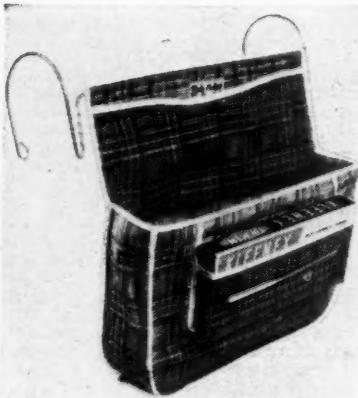
Mombasa, Kenya.

R. H. N. CRESWELL.

D



Accessories



Litter in the Car

DESIGNED to hold maps, handbooks, vacuum flasks and other impedimenta of the motorist, the Kar-Tidee hitches over a seat back by plated clips. Made of a strong tartan-patterned p.v.c. cloth, it is quite large—approximately 1ft 3in wide, 1ft 4in tall, and 3½in front-to-rear. In the front compartment, there is a packet of Kleenex cleaning tissues.

The makers are Karobes, Ltd., Queensway, Leamington Spa, Warwickshire. The Kar-Tidee costs £1 19 6d.

Glass Fibre Repairs

TESTS have been made of two companion products of Bondaglass, Ltd., 55, South End, Croydon, Surrey—a car repair kit which costs 13s 9d plus 1s 6d postage, and the Bondafiller Handypack, 6s 6d plus 1s 6d postage. The repair kit includes three sq ft of glass fibre mat, and 10 oz of resin and filler; it was used to repair the torn wing of an old car, using the now familiar technique, which is described in a leaflet included in the pack; the resulting patch was strongly adhesive to the rusted metal and provided a fully satisfactory reinforcement.

The Bondafiller comprises a resin and a powder which, when mixed to a putty-

Top: A twin-carburettor layout for the Vauxhall Victor, and the APA sponge-washer. Left: The Kar-Tidee, which fits over a seat squab. Right: Wingard's sun visor on a Ford Consul

like consistency can be knifed on to rusted and dented areas. It sets hard in a matter of minutes and is readily dressed to a smooth finish ready for painting.

Glass Fibre Vizor

THE windscreens exterior vizor of Wingard, M.A., Ltd., Kingshorne Road, Chichester, Sussex, is made of resin-impregnated glass fibre. It seems particularly strong and stiff, and it was judged that there must be a good resin mix, and considerable reinforcement with glass fibre. The swaged design must also help with stiffness.

Fitting is by self-tapping plated screws, presenting no difficulty. Models are available for popular cars. The smooth resin surface should accept modern synthetic finish to match bodywork. The price is from £3 12s 6d, so that, though strong, this is an inexpensive vizor.

Sponge Hose

BESIDES their convenience, car washing sponges with water constantly fed through by an attached hose keep the sponge free of grit. The sponge of the APA set has coarse pores, which further help in this. Its plastic is of some strong type, judged to be far more resistant to wear than soft-foam sponges. The back is rubber; throughout, there seems to be nothing which could scratch paint. There is a hollow handle, in which detergent sticks may be placed, and, with the brush removed, the hose may be fitted with a spray or jet nozzle.

The claim is made that when removed from the hose, the sponge can be used as a leather for polishing. It is quite good at this, though not so good as "imitation chamois leather" of plastic fibre. Though thin-walled, and liable to kink, the plastic



hose is strong and resistant to abrasion. The APA Sponge Washer is a product of L. F. Brenner, Ltd., 235, Halfway Street, Sidcup, Kent. Prices are: Sponge and head with five detergent sticks, £1 14s; with 45ft hose, £2 16s; extra detergent sticks, 2s a box of five. A replacement sponge and head is 19s 6d.

Victor Twin-Carb

THE latest performance conversion kit to be developed by Alexander Engineering Co., Ltd., of Haddenham, Buckinghamshire, is a two-carburettor type for the Vauxhall Victor. For this conversion, the normal step of increasing the geometrical compression ratio has been avoided, for investigations revealed that bearing loads were too high with the increase in peak explosion pressures which occur with such a modification. Instead, a system of resonant induction has been developed, which has resulted in a two-carburettor layout with numbers 1 and 4 cylinders connected to one, and numbers 2 and 3 cylinders to the other.

The effective pipe length of each induction tract is different, to take advantage of resonant effects to assist filling. The result is that there is only a slight increase in peak pressure, but noticeable improvement in the mean pressure throughout the stroke, so that the torque developed is greater throughout the operating range. In actual figures the mean torque improvement over standard is 15 lb ft.

In a short demonstration run in a car fitted with one of these conversion sets top gear flexibility was greatly improved and pick-up from low speeds was smooth, a characteristic which continued throughout the engine's operating range.

With no head changes, the conversion consists solely of an induction assembly, and the cost of the complete kit is £42.



The Sport

By PETER GARNIER



FERRARI HAS announced that, instead of sending a single car to Oporto for this Sunday's Portuguese G.P. as previously decided, he has entered three Dino 246 cars, to be driven by Mike Hawthorn, W. von Trips and Phil Hill. Scuderia Centro-Sud have entered three Maseratis, for Joakim Bonnier, Francesco Godia and the American driver Troy Rutmam. British entries will consist of three Vanwalls (Stirling Moss, Tony Brooks and Stuart Lewis-Evans), two B.R.M.s (Jean Behra and Harry Schell), and two Lotuses (Cliff Allison and Graham Hill). Coopers, also, will enter the fray.

The race, which has the distinction of counting for the Drivers' Championship this year for the first time, will be held on the 4.6-mile round-the-houses circuit in Oporto, normally used for the annual sports car Grand Prix of Oporto. Unlike Monte Carlo, with its virtually non-existent straights, Oporto boasts one long, fast stretch on which speeds of up to 150 m.p.h. can be achieved. Outstanding difference between this and other *grandes épreuves* is that the Oporto circuit is used in an anticlockwise direction. The lap speed is surprisingly high for a circuit of this type, Villaresi putting in a lap in the 3.3-litre Lancia sports-racing car at 94.82 m.p.h. in 1954, so the race speed should be 100 m.p.h. or more. The start of the G.P. will be at 4 p.m. on Sunday and the race will be over 50 laps—370.35 km., or 230.13 miles—and will comply, therefore, with the C.S.I.'s requirements both as regards the 300 km. minimum distance and the two hours' duration.

Practice will take place on 22 and 23 August, and all drivers will have to do a minimum of 12 laps during these two periods—the times of which were not included in the regulations.

WORKS TEAMS from two British manufacturers have been entered for the forthcoming *Marathon de la Route*—the fully justified title of Belgium's 3,300-mile, 96-hour, non-stop Liège-Rome-Liège Rally. B.M.C. entries consist of four Austin-Healey 100-Sixes (Pat Moss and Ann Wisdom; Nancy Mitchell and Ann Hall; Joan Johns and Sam Moore; Gerry Burgess and Sam Croft-Pearson), and an MGA (John Gott and Ray Brookes). The four Austin-Healeys will compete for the Manufacturers' Team Prize, and the Austin-Healeys of Pat Moss, Nancy Mitchell and Joan Johns, together with John Gott's MGA, will compete for the Club Team Prize.

The Standard Company has entered four Triumph TR3s, the crews differing considerably from those that normally represent the company in International rallies; they will be as follows: R. de Lageneste (Switzerland) and P. Blanchet (France); R. Leidgens and C. Dubois, of Belgium; M. Gatsionides and R. Gorris, of Holland; and Miles. A. Soisbault and R. Wagner of France. Picked from all over the Continent of Europe, this team is very strong. Lageneste is one of Europe's young drivers, and was co-winner of the Alpine this year; he was seventh in the Liège-Rome-Liège in 1956, and fourth last year. Blanchet is an experienced

navigator, and is Lageneste's own choice. Leidgens is one of Belgium's best rally drivers, with long experience in this event (15th in 1954, 6th in 1955 and 5th in 1956, all in Triumphs); Dubois has driven with him on many occasions, and is a member of Belgium's national racing stable, Equipe National Belge. "Gats" needs no introduction, having driven for Triumphs for the past four years; Gorris is his latest protégé. Annie Soisbault is France's reigning women's champion, has been leading the Women's Rally Championship on and off this season, and is now only two or three points behind Pat Moss and Ann Wisdom; Renee Wagner has been well known in the European rally scene for several seasons, and was co-winner of the Coupe des Dames in this year's Monte.

As well as the above Triumph entries, there are to be three further cars, all TR3s, representing the British Army. They will be driven by Lt. Col. M. G. M. Crosby, O.B.E., M.C., and Major R. W. Holmes; Capt. P. Scarf and Capt. T. Simonds; Major J. E. T. Raper and Major J. O. Parry. Between them, these six drivers share an aggregate of 11 Monte Carlo Rallies, five Tulips, five R.A.C. Rallies and three German Rallies.

IN THE AUGUST issue of the American magazine, *Hot Rod*, there is a leader on the subject of the Brighton Speed Trials—which finishes thus: “So, what's all this leading up to? Just this: if our current plans work out, there'll be a Hot Rod Magazine Spl. competing at Brighton this year; a U.S. entry, representing the hot rod sport. The car and driver have already been determined—they're both F.I.A. licensed and recently set new National and World records for the standing kilometre.”

Nobody would be happier than British enthusiasts to see an American “dragster” at Brighton—or anywhere else in Britain, for that matter; they are fabulous machines. But I can't help feeling that, on the comparatively short Madeira Drive, there just isn't room to stop at the end of the kilometre if standard dragster brakes are fitted; it will surely be necessary to attend to this aspect of the car if it is to run at Brighton!

It is a wonderful thought, though, and I hope it can be managed—as Wally Parks, says in his leader, “Nobody loves and appreciates the automotive performance sports more than do the English. We hope to be able to add something to their spectacular Brighton event's interest, and we anticipate gaining a lot of new friends while we're at it.” They certainly will.

YET ANOTHER association of motor clubs has been formed, this time of clubs in the London district. It is to be known as the London Counties Association of Motor Clubs, and has as its objects, “Liaison and mutual consultation on all matters connected with motor sport, and in the production of the Calendar; and to present the views of the clubs to the R.A.C. Competition Committee.” Membership is open to any R.A.C.-recognized

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LIÈGE-ROME-LIÈGE

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club wishing to join; member clubs at present consist of: Bedford M.C., English Electric Stevenage, Falcon M.C., Jaguar D.C., London M.C., Mascot M.S.C., Murphy M.C., Navigators' Club, North London Enthusiasts' Club, Sporting O.D.C., and the United Hospitals and University of London M.C.

This current tendency for clubs to form associations is an excellent thing. If each of the member clubs is willing to some extent to pocket its pride and, instead of running a succession of lesser events, combine to run one really good one, it will ease the present congestion of the Calendar: it might also enhance the popularity of the sport by giving it some thing of a scarcity value.

IN THE LIST of British fixtures for 1958, contained in the R.A.C. Motor Sport Year Book, there are 194 events down for the month of October alone; 125 of these are rallies. November is even busier; out of a total of 195 events listed, 148 are rallies, making a total of 273 rallies in two months, or roughly 30 a week-end.

Would it not be better for the clubs who organize these events, each making its own small niche in the Calendar, to group themselves into centres; the 300-odd R.A.C.-recognized clubs in the country could make, say, ten centres of 30 clubs apiece. Each group of clubs, then, operating as a unit, might be allocated, say, 15 “open to centre” permits each year. These would entitle them to run 15 road events on a “heats” basis, the first so-many cars in each of the 12 heats moving on to the two semi-finals, and finally to the final—in which a win would be worth having. There might also be an Inter-Centre Championship, the teams from each centre being made up of the winners of each of the 15 events run by the centre.

Instead of the wealth of organizing skill and knowledge possessed by the British clubs being disseminated on hundreds of insignificant, small rallies, it would be concentrated into running fewer, and more worthwhile events. Ultimately, the honour of running the R.A.C. Rally of Great Britain might be given to the centre that had organized the best series of events during the previous year—as judged by R.A.C. stewards.

VENEZUELA'S Grand Prix, which last year counted for the Sports Car Championship, is not to be held this year. This leaves the Tourist Trophy race, Britain's contribution to the Championship, as the last qualifying event—unless another event is designated to take the place of the Venezuelan G.P.

SEVERAL INTERESTING points are covered in the latest R.A.C. Motor Sport News Bulletin. A new permit application form has been introduced, which it is hoped will reduce the amount of work required of club secretaries and, at the same time, simplify the task of the Competitions Department of the R.A.C. In filling in the form (M.58), it will not be necessary to repeat any of the information

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already given in the Additional Supplementary Regulations for the event—only to insert the number of the paragraph in the Supplementary Regulations in which the requisite information is contained. This new form must be used for all permit applications after 1 August 1958.

One requirement is that the Additional Supplementary Regulations shall always be set out in the same order, and that there shall be no repetition of any Standing Supplementary Regulations, or inclusion of any other extraneous matter. The R.A.C. realize that this will, to some extent, conflict with some clubs' traditional layout of their Supplementary Regulations, but such is the volume of motor sport these days that it is necessary to adopt a set pattern—or else increase the staff dealing with this aspect of the work of the Competitions Department, with the inevitable increase in charges.

Following the failure of a certain type of Berkeley wheel in races, it has been decided to ban these wheels. They can be recognized by the fact that the attachment lugs by which the rim is bolted onto the wheel spider consist of angle pieces, or lugs, welded onto the well of the rim. Failures have invariably been at the bend in these angle pieces, or at the welds themselves.

In the list of new tyres permitted under the R.A.C. Trials Car National Formula, published in the 1958 edition of the R.A.C. Motor Sport Year Book, India Super Multigrip should be deleted.

Following experiments with oil deposits on racing circuits carried out by the British Racing Drivers' Club, the following observations have been published: Oil on the track generally falls into one of three categories—1, a fine spray, caused by a leak on the pressure side of the system or from badly fitting oil tank caps when surge takes place. 2, Accumulation of droppings from free flow oil systems

used on motor cycles and 500 c.c. cars. 3, A mass of oil deposited by the sudden emptying of the sump or oil tank. This is usually restricted to a relatively small area.

Experiments have established that dry cement powder will completely eradicate traces of oil—though this does not mean that one gallon of oil will vanish after the application of, say, 1 lb of cement powder: the result will merely be a slippery mess.

In cases 1 and 2, where there is no more than a film of oil on the track, a fine dusting of cement should be applied to the area—by means of a shovel, the cement being scattered from windward to leeward of the oil patches. On no account must a large quantity of cement be used; it will clog the surface of the road when it hardens . . . in addition to creating a dust storm, and, by making the surface slippery through the dust itself, create a further hazard. In case 3, where there is a mass of oil, this should be soaked up with sand or sawdust, which, particularly in the case of sand, must be swept up carefully, as it will act as a million small ball bearings, with equally disastrous results. When the sand or sawdust has been brushed away, cement should be brushed over the area to kill the remaining film of oil.

It is emphasized that the cement must not be lumpy, but must be dry and reasonably new. Its advantages are that it can be applied during racing and does not need sweeping up: that it has good non-slip properties when properly used: that it will eliminate completely all traces of oil: that it costs little in relation to patent cleaners, and that it works quickly.

Since 1 January this year, no fewer than 34 new clubs have applied for—and received—R.A.C. recognition, and can now promote competitions. Not all of these are based in this country, one or two having their address in such distant parts as Jamaica and South Africa.

One point on which there seems to be a certain amount of doubt in some quarters concerns the cancellation of the

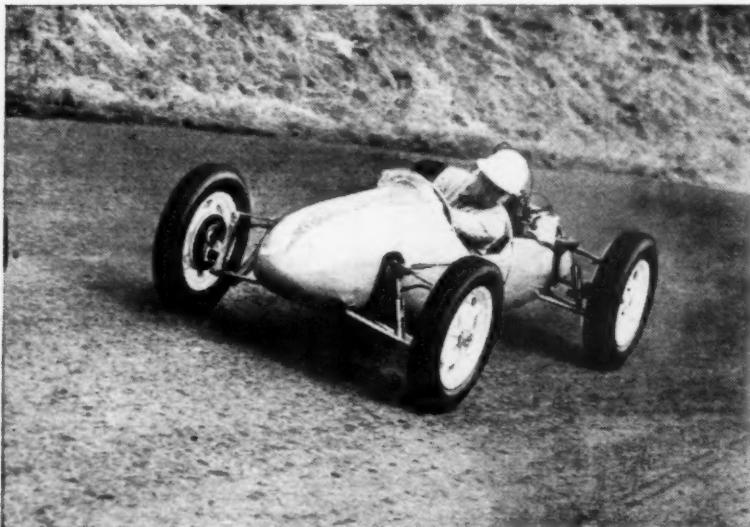
endorsement on the back of an F.I.A. licence before the holder may take part in International races (as distinct from rallies). The rules governing this, though unchanged, are published in the Bulletin as a reminder. "Drivers who have not had racing experience prior to 1 January 1956 must have competed satisfactorily in a minimum of six (club) race meetings in order to be able to obtain an unrestricted International Competition Licence. Drivers' satisfactory performances are certified by the R.A.C. Steward of the meeting on a record card, copies of which may be obtained on request from the Competitions Department. Only one signature is given per race meeting, and not for individual races at a meeting or for participation in sprints and hill-climbs, which do not qualify. Drivers must notify the promoters before the start of a meeting at which they wish their record card to be signed."

HAVING WON the Gaisberg hill-climb last weekend, W. von Trips has virtually ensured his position as European Hill-climb Champion for 1958—or, more romantically, "Champion d'Europe de la Montagne." His two climbs of the 8.625km hill in his Porsche—both in 9min 24.3sec—comfortably beat the time set up by Daetwyler, 1957 Champion, of 9min 49.6sec with his 2-litre Maserati in last year's event. Results of the hill-climb are as follows:—

1. Porsche (W. von Trips), 9min 24.3sec; 2, Borgward (J. Bonnier), 8min 33.4sec; 3, Borgward (H. Herrmann), 9min 33.5sec; 4, Porsche (E. Barth), 9min 33.9sec; 5, Porsche (J. Behra), 9min 37.2sec.

Positions in the Championship now stand as follows: 1, W. von Trips, 38 points; 2, H. Herrmann, 30; 3 (equal), J. Bonnier and E. Barth, 25; 5, (equal), J. Behra and G. Cabianca, 23. Trips, Barth and Behra have scored their points in Porsches, and Herrmann, Bonnier and Cabianca in Borgwards. The last event to count for the Championship will be at Ollon-Villars, in Switzerland, on 31 August.

CRAIGANTLET



Festest time of the day: Boshier-Jones takes the Cooper-J.A.P. up Craigantlet in 1min 9.99sec

DAVID BOSHIER-JONES, driving the 1,098 c.c. Cooper-J.A.P., put up fastest time of the day in the Craigantlet hill-climb promoted by the Ulster Automobile Club last Saturday. He returned a splendid 1min 9.99sec on his first climb, which is just three-quarters of a second short of the record. Unfortunately, on his second ascent, he crashed after a very fast departure from the line, his car overturning. He was treated in hospital.

Second fastest was J. Berry, in the 1,960 c.c. E.R.A. Special (supercharged), with a time of 1min 13.97sec.

RESULTS

Production saloon cars, up to 1,000 c.c.: 1, Speedwell Austin A35 (P. B. Hopkirk), 1min 35.09sec; 2, Speedwell Austin A35 (I. H. Titterington), 1min 37.9sec; 3, DKW (F. A. Kean), 1min 40.6sec. **Over 1,000 c.c. and up to 1,500 c.c.:** 1, Riley (J. R. Martin), 1min 33.4sec; 2, Riley (S. Moore), 1min 33.8sec; 3, Riley (J. R. Martin), 1min 34.0sec; 4, Jensen (E. D. Maguire), 1min 34.4sec. **Production sports cars over 1,500 c.c. (unsupercharged):** 1, A.C.-Bristol (W. E. T. Bradshaw), 1min 25.3sec; 2, Triumph TR3 (W. J. Reid), 1min 26.95sec; 3, Triumph TR3 (D. A. Henderson), 1min 28.64sec. **Antique cars (exceeding racing) up to 1,000 c.c.:** 1, 1.172 c.c. Crossle-Ford (A. L. Crossle), 1min 22.3sec; 2, DKW (F. A. Kean), 1min 40.6sec; 3, 750 Austin (N. G. Gibson), 1min 51.9sec. **Over 1,300 c.c.:** 1, 1,500 c.c. Lotus-Climax (M. Templeton), 1min 16.22sec; 2, A.C.-Bristol (W. E. T. Bradshaw), 1min 25.3sec; 3, 1,496 c.c. Frazer-Nash (Lord Dunraven), 1min 26.3sec. **Formula Libre:** 1, 1,098 c.c. Cooper-J.A.P. (D. Boshier-Jones), 1min 9.99sec; 2, 1,960 c.c. E.R.A. Special (J. Berry), 1min 13.97sec; 3, 1,460 c.c. Cooper-Climax (J. R. Pringle), 1min 14.15sec. **Handicap open to cars complying with Appendix J of the Sporting Code:** 1, Riley (S. Moore), 1min 9.5sec (handicap 25sec); 2, Bristol (W. E. T. Bradshaw), 1min 13.3sec (handicap 12sec).

RACE AND RALLY REGULATIONS RECEIVED

East Anglian M.C.—Clacton Rally, 26-27 September; most principal and local clubs are invited. Cars divided into classes for saloons, *gran turismo* and specials; subdivided into capacity classes. Start, at the Welsh Harp, Edgware Road, London; Runcorn Towers Motel, Kenilworth; and Bury St. Edmunds. The event will consist of a straightforward night rally with driving tests held in daylight; prize giving and results will be at the conclusion of the rally. Entry fee £3 3s. Regulations from E. S. Ridley, 1, Out Northgate, Bury St. Edmunds.

M.C.C.—Sprint Meeting at Wellesbourne Mountford, near Stratford-on-Avon, on Saturday, 13 September. Invited clubs: Bentley D.C., Vintage M.C.C., 750 M.C., Triumph Owners' M.C.C., Morgan Three-Wheeler Club, M.M.C.C., Wood Green and D.M.C., Bulldog M.C.C. Entries (to J. A. Masters, 76, Kinnerton Street, Knightsbridge, London, S.W.1) close on Saturday, 13 September. Each entry will be given three runs, which will be timed, from a standing start over a distance of 440 yards.

Snettisham Motor Racing Club: Scott-Brown Memorial Trophy meeting, Sunday, 7 September, open to members of the promoting club, and the invited clubs. Meeting starts at 2 p.m., with events for Elva and Lotus cars fitted with Climax engines of not more than 1,100 c.c. (five laps), closed grand touring and special grand touring cars (subdivided into capacity classes; five laps), sports cars up to 1,100 c.c. (10 laps), sports cars over 1,100 c.c. (subdivided into capacity classes; 10 laps), formula 3 (8 laps), and *formule libre* (15 laps). Entries, at £2 a car, to Oliver Sear, Old Buckenham Hall, Attleborough, Norfolk, by 26 August; if vacancies still exist, further late entries will be accepted at an entry fee of £5 until 3 September.

Romford Enthusiasts' C.C.: September Sprint meeting at Snettisham; Sunday, 14 September, starting at 2.30 p.m. Invited clubs: East Anglian, M.G.C.C. (S.E. Centre), 750, West Essex, Snettisham M.R.C., North London Enthusiasts, Thames Estuary, Cambridge University, Bentley D.C., Ford Sports M.C., Club Lotus. Course approximately three-quarters of a mile, starting on the Home Straight and passing through the Essex and Coram Curve. Classes for standard production, and modified saloons, sports and *gran turismo* cars, and racing cars (*formule libre*).

A.C. Owners' Club: Point-to-point, starting 10.30 a.m. from the Grasshopper Inn, near Westerham, Kent, on 5 October. Route of 100 miles suitable for all cars, divided into five sections; competitive element provided by the ingenuity of the clues.

B.A.R.C. (South-Western Centre): 19th Brunton Hill-climb, Sunday, 7 September, 2.30 p.m. Open only to members of the promoting club; timed runs of a metalled hill of approximately one-third of a mile in length. Classes for saloon, closed, sports, sports-racing and racing cars. Entries close 28 August, limited to 100. Entries to W. R. Short, 5, Brownhill Road, Chandler's Ford, Eastleigh, Hampshire.

Pathfinders and Derby M.C.: Midland Rally, 20 to 21 September; starting at the Green Man Garage, Ashbourne, at 10 p.m.; road mileage approximately 200. Regulations and entry forms from J. W. E. Jordan, Higherside, Repton, Derby.

South Wales A.C.: Castel Hill Climb, Sunday, 21 September (instead of Sunday, 14 September, as originally planned). Classes for racing, sports and saloon cars. Regulations from M. G. Parker, Fairacre, Cardiff Road, Llandaff, Cardiff.

Land-Rover O.C.: Cranbourne Rally, 6 and 7 September, to be run in conjunction with the Cranbourne Festival. Land-Rover Trial to be held on Saturday morning, and Four-wheel-drive Tour on Sunday afternoon. First, second and third prize-winners in the Trial will be flown to Holland for the Dutch Land-Rover O.C. Rally on 20 September. Entry forms from R. R. Waller, 16, Sackville Road, Sutton, Surrey.

CLUB NEWS

M.G.C.C. (N.W. Centre):—Results of the Chelmsford Gymkhana, held on Sunday, 10 August, are as follows:

Best performance: M.G. TD (R. H. F. Jones and Miss M. Meacham). **Concours results**: B.M.C. Open cars: M.G. TD (R. H. F. Jones). B.M.C. Closed cars: M.G. TD (Mrs. A. Holt). Other makes: Rover (H. Clarke). **Ensuite**: Closed: Aston-Martin DB2-4 (J. Mayson and Mrs. R. Mayson). Open: M.G. TD (R. H. F. Jones and Miss M. Meacham). **Treasure Hunt**: Morris Minor 1000 (J. H. Brooks), M.G. TD (J. H. Brownlow). **Nash Metropolitan** (R. C. Porsfield). **Driving Test**: Open: M.G. (P. W. D. Smith). Closed: Austin (J. M. Mitchell).

North London Enthusiasts' C.C.:—Friday, 22 August: East Herts County Club, Hall Lane, Watford Way, Hendon: 8 p.m., dancing. 8.30 p.m., John Gott on his experiences in the 1958 Alpine Rally, together with Chris Tookey, who will show colour slides of the event. Admission free.

Berwick and D.M.C.:—Results of the Demonstration driving tests, held on the Parade Ground, Berwick-on-Tweed, on Saturday, 9 August, are as follows:

1. Triumph TR3 (J. Clark); 2. Triumph TR2 (P. Burghass); 3. MGA (J. Murray); 4. MGA (B. Tunnock).

B.R.S.C.C.:—The closed race meeting scheduled to take place at Brands Hatch on 7 September has had to be cancelled because of unforeseen circumstances.

M.C.C.:—Members have been invited to compete in the following events: 31 August, Vintage M.C.C., sprint meeting at Ely, Cambridgeshire. Information from E. E. Thompson, 28, Glover Road, Pinner, Middlesex. 20 September, Peterborough M.C., Silverstone race meeting. Information from B. A. Nicholls, Luffenham Court, Lyndon Road, North Luffenham, Oakham. 15-16 November, Sunbeam, Airline Rally. Information from J. D. Woodhouse, 106, Jockey Road, Sutton Coldfield. Circle C.C., Rally (Surrey), 16 November. Information from Mrs. M. Paul, Flat 2, 14, Hardwick Road, Eastbourne.

Club Lotus:—In view of the large membership—now over 600—Ian Smith has had to resign his position as secretary; the post has been taken over by Ron Clover, of 70, Finsbury Pavement, London, E.C.2. Ian Smith takes over the post of Chairman of the Committee; this position has been vacated by Alan Smith in order that Ian may take it over, in recognition of his work in building up the Club.

Lothian Car Club:—Forthcoming activities are as follows: 3 September, Festival Driving Trophy, at the Waverley Market, Edinburgh, 7 p.m. September 17, Skittles match at Corstorphine Inn, Edinburgh, at 7 p.m. 5 October, driving test meeting, Drem Aerodrome, 12.30 for 1 p.m.

COMING SHORTLY

AUGUST 23.—M.G.C.C., Silverstone meeting, 12 noon.
23.—B.A.R.C. Members' meeting, Goodwood, 2 p.m.
24.—Portuguese Grand Prix, Oporto, 4 p.m.
24.—Harrow C.C., Heston driving tests, 11 a.m.
24.—West Hants and Dorset C.C., Speed hill-climb, Wiscombe, 2.30 p.m.
24.—Thames Estuary A.C., Speed hill-climb, Stapleford Airfield, Chigwell, 9 a.m.
27-31.—Liège-Rome-Liège Rally.
30.—Midland A.C., Shelsley Walsh meeting, 1 p.m.
30.—B.R.S.C.C. Race Meeting, Brands Hatch.
30.—Sussex C. and M.C.C., Inter-Club driving test meeting, Goodwood, 12 noon.
SEPTEMBER 6.—Brighton and Hove M.C., Brighton Speed Trials, Madeira Drive, Brighton, 9.30 a.m.
6.—S.U.N.B.A.C., Silverstone Race Meeting, 12 noon.
7.—Mid-Cheshire M.C., Driving Test meeting, Royal Naval Air Station, Stretton, 2 p.m.
7.—Malden and D.C.C., September Morn driving test meeting, City Square, U.S.A.F. Base, Denham, 10.30 a.m.
7.—Bentley D.C., Firle Hill-climb, 2 p.m.
7.—Italian Grand Prix, Monza.

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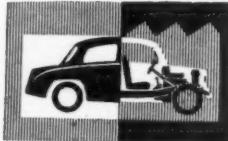
Usual Garage

(A22/R/58)



This new district office and warehouse was recently opened in Aberdeen by the Firestone Tyre and Rubber Co., Ltd., Brentford, Middlesex

Trade and



Industry

Mr. R. J. Tristram has been appointed technical representative by the Moss Gear Co., Ltd.

Lord Essenden, whose motor racing activities were well known when he was the Hon. Brian Lewis, has been appointed a director of Godfrey Davis, Ltd.

Forge Motors of Poynings, Sussex, have taken over St. James's Motors, of 37-38, Upper St. James's Street, Brighton. They have been appointed Goggomobil distributors for East Sussex.

A new car hire centre is to be opened shortly in Dersingham Road, Cricklewood, London, N.W.2, by the J. Davy Group of hire and car sales companies. The Davy fleet now numbers some 1,250 cars.

Alexander of Edinburgh, Ltd., have opened a new service department at their Semple Street branch. It has been specially designed to avoid loss of workshop space caused by the parking of cars left all day for routine service. The equipment is of Tecalemit manufacture fed by Castrol lubricants.

Reference was made last week to Mr. Brian Simmonds having left the Car Mart, Ltd., after nearly 21 years' service to take up a new appointment. The further details given were not quite correct: he has joined Guy Salmon (Teddington), Ltd., at their recently acquired premises in Teddington High Street.

As part of a policy of decentralization to give greater responsibility in the management divisions of Automotive Products Co., Ltd., three board appointments have been made. Mr. B. G. L. Jackman has been appointed executive director of the Lockheed Hydraulic Brake Co., Ltd.; Mr. C. Webster becomes executive director in charge of the export division; and Mr. A. R. W. Murray is to be secretary of the holding company, Automotive Products Associated, Ltd., in addition to his present responsibilities.

The United Dominions Trust, Ltd., have moved their St. Albans, Hertfordshire, office to 29, London Road; the telephone number remains 55412.

Mr. A. D. Walsh, B.Sc., has been appointed sales secretary to Pirelli, Ltd. He is based at the Burton-on-Trent factory.

Two new jetties are under construction at the Grangemouth refinery in Scotland of the British Petroleum Co., Ltd., for the loading of coastal vessels with refined products.

Mr. T. G. Manwaring has retired from Smiths Motor Accessory Division after 35 years' service. Four years after joining the company he became the first technical sales representative for the motor accessory division.

Among the manufacturers of auxiliary equipment warming up for the London Motor Show in October are the Triplex Group and William Turner (Kismet). The former will be showing electrically heated rear windows, claimed to be free from misting, and the latter will have a master dial against which passers-by may check their pocket tyre-pressure gauges.

A pair of new, lightweight portable compressors has been introduced by Hill-Barnes (Pumps), Ltd., Field Head Works, Markfield, Leicester. The A model looks after most pneumatic requirements in the service station, while the B model is for spraying paint and other liquids. Either version costs £30 10s; details may be obtained from the company.

A booklet of great value to the motor transport industry, "The Loads You Carry," by the staff of our associated journal, *Motor Transport*, is published by Iliffe and Sons Ltd., Dorset House, Stamford Street, London, S.E.1, at 2s 6d net (postage 6d). It gives detailed information on specialized transport, including weight, stowage, bulk, packaging vehicles and special requirements of the law.

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Alce-Bristol	1,446	0	0	2,170	7	0
Alceas	1,700	0	0	2,551	7	0
Alceco-Bristol						
ALFA ROMEO						
Giulietta	1,678	0	0	1,918	0	0
Giulietta TI	1,395	0	0	2,093	17	0
Giulietta Veloce	1,798	0	0	2,698	17	0
1900 Super	1,665	0	0	2,498	17	0
Super Sprint	2,250	0	0	3,376	7	0
ALLARD						
Palm Beach (Ford)	1,050	0	0	1,576	7	0
Palm Beach (Jaguar)	1,300	0	0	1,951	7	0
Gran Turismo	1,700	0	0	2,551	7	0
ALVIS						
Sports saloon 3-litre	1,995	0	0	2,993	17	0
Convertible	2,195	0	0	3,293	17	0
AMBASSADOR						
Super 4-door	1,630	0	0	2,446	7	0
Estate car	1,725	0	0	2,588	17	0
Custom 4-door	1,700	0	0	2,551	7	0
Country estate car	1,795	0	0	2,693	17	0
ARMSTRONG SIDDELEY						
Sapphire 346	1,100	0	0	1,651	7	0
(automatic)	1,195	0	0	1,793	17	0
Limousine	1,910	0	0	2,866	7	0
(automatic)	2,099	0	0	3,149	17	0
ASTON MARTIN						
DB Mk. III	2,050	0	0	3,076	7	0
Droplead Coupé	2,300	0	0	3,451	7	0
ASTRA						
Utility	308	0	0	471	16	0
AUSTIN						
A.35 2-door	379	0	0	569	17	0
2-door de luxe	387	15	0	582	19	6
A.35 4-door	396	10	0	596	2	0
4-door de luxe	400	0	0	601	7	0
Countryman	444	0	0	667	7	0
A.55 Cambridge	538	0	0	808	7	0
A.55 de luxe	570	0	0	856	7	0
A.95 Westminster	689	0	0	1,034	17	0
A.95 de luxe	719	0	0	1,079	17	0
Countryman	834	0	0	1,252	7	0
A.105	823	0	0	1,235	17	0
(automatic)	885	10	0	1,329	12	0
Vanden Plas	982	10	0	1,475	2	0
(automatic)	1,045	0	0	1,568	17	0
Gipsy	650	0	0	650	0	0
(diesel)	755	0	0	755	0	0
AUSTIN-HEALEY						
Sprite	445	0	0	686	17	0
100-Six	817	0	0	1,226	17	0
BENTLEY						
Series S	3,695	0	0	5,543	17	0
L.W.B.	4,595	0	0	6,890	17	0
Freestone and Webb	5,187	0	0	7,781	17	0
Hooper	4,990	0	0	7,486	7	0
H. J. Mulliner	5,455	0	0	8,183	17	0
James Young	4,915	0	0	7,373	17	0
Continental						
H. J. Mulliner	5,275	0	0	7,913	17	0
Four door	5,355	0	0	8,033	17	0
Park Ward	4,995	0	0	7,493	17	0
BERKELEY						
Two-seater 328 c.c.	332	7	6	490	18	3
492 c.c. de luxe	432	9	0	650	0	0
B.M.W.						
501 2.6	1,638	0	0	2,458	7	0
502 2.6	1,792	0	0	2,687	7	0
502 3.2	1,970	0	0	2,956	7	0
502S 3.2	2,165	0	0	3,248	17	0
503	3,500	0	0	5,251	7	0
BORGWARD						
Isabella	830	0	0	1,246	7	0
Combi estate car	880	0	0	1,321	7	0
Touring sport	950	0	0	1,426	7	0
TS coupé	1,330	0	0	1,996	7	0
BRISTOL						
405	2,390	0	0	3,586	7	0
Convertible	2,450	0	0	3,767	7	0
BUICK						
63 Century	2,175	0	0	3,263	17	0
CADILLAC						
6309 Fleetwood	3,425	0	0	5,138	17	0
6239D sedan de ville	3,125	0	0	4,688	17	0
CHEVROLET						
Bel Air	1,410	0	0	2,116	7	0
Sport	1,440	0	0	2,161	7	0
Convertible	1,555	0	0	2,333	17	0
Nomad estate car	1,500	0	0	2,251	7	0
Corvette	1,906	0	0	2,860	7	0
CHRYSLER						
300C	2,740	0	0	4,111	7	0
Convertible	2,960	0	0	4,441	7	0
Imperial	2,885	0	0	4,328	17	0
Crown	3,045	0	0	4,568	17	0
CITROËN						
2 c.v.	398	0	0	598	7	0
ID19	998	0	0	1,498	7	0
DS19	1,150	0	0	1,726	7	0
DAIMLER						
One-O-Four	1,595	15	4	2,395	0	0
Majestic	1,662	8	0	2,495	0	0
DK400A	2,795	15	4	4,195	0	0
DK400B	2,875	15	4	4,315	0	0
Hooper limousine	4,385	0	0	6,578	17	0

(Continued overleaf)

U.K. List Price · With Tax

D.B.	£	s	d	£	s	d
Rally HBR5	1,299	2	0	1,950	0	0
DELOW						
Mark VI	575	0	0	862	17	0
Mark VI sports	625	0	0	938	7	0
D.K.W.						
Fixed-head coupé	765	0	0	1,148	17	0
Four-door saloon	798	0	0	1,198	7	0
Universal estate car	830	0	0	1,246	7	0
1000 fixed-head coupé	650	0	0	1,276	7	0
DODGE						
Custom Royal	2,040	0	0	3,061	7	0
EDSEL						
Pacer	1,635	0	0	2,453	17	0
Corsair	1,991	0	0	2,987	17	0
Citation hardtop	2,100	10	0	3,152	2	0
FACEL VEGA						
FVS hardtop (automatic)	3,150	0	0	4,726	7	0
FAIRTHORPE						
Custom	2,980	0	0	4,471	7	0
FIAT						
500 de luxe	370	0	0	556	7	0
600	432	0	0	649	7	0
Convertible	452	0	0	679	7	0
Multiplo 4/5	532	0	0	799	7	0
Multiplo 6	540	0	0	811	7	0
1100	578	0	0	869	2	0
1200 Full Light	798	10	0	1,199	2	0
1400B	774	0	0	1,162	7	0
1900B	980	0	0	1,471	7	0
1900B Full Light	1,385	0	0	2,078	17	0
FORD						
Popular	295	0	0	443	17	0
Anglia	380	5	0	571	7	0
Anglia de luxe	400	0	0	601	7	0
Prefect	415	0	0	623	17	0
Prefect de luxe	438	0	0	658	8	0
Escort	434	0	0	652	7	0
Squire	463	0	0	695	17	0
Consul	545	0	0	818	17	0
Consul de luxe	580	0	0	871	7	0
Convertible	660	0	0	991	7	0
Estate car	760	0	0	1,141	7	0
Zephyr	610	0	0	916	7	0
(automatic)	725	0	0	1,088	17	0
Convertible	778	0	0	1,168	7	0
Estate car	825	0	0	1,238	17	0
Zodiac	675	0	0	1,013	17	0
(automatic)	790	0	0	1,186	7	0
Convertible	873	0	0	1,310	17	0
Estate car	895	0	0	1,343	17	0
FORD (American)						
Thunderbird hardtop	2,133	10	0	3,201	12	0
FORD (Canadian)						
Custom 300	1,307	0	0	1,961	17	0
Fairlane 500 Town	1,377	0	0	2,066	17	0
500 Town Victoria	1,409	0	0	2,144	7	0
Ranch Wagon	1,362	0	0	2,044	7	0
FORD (Germany)						
12M	702	0	0	1,054	7	0
15M	763	0	0	1,145	17	0
FRAZER NASH						
Sebring	2,500	0	0	3,761	7	0
GOGGOMOBIL						
T.300 Mayfair	329	0	0	494	17	0
T.400 Mayfair	342	6	0	514	16	0
T.300 Regent	416	0	0	625	7	0
Convertible	458	0	0	688	17	0
T.500 Regent	428	13	4	644	7	0
Convertible	471	0	0	707	17	0
HILLMAN						
Minx Special	498	0	0	748	7	0
Minx de luxe	529	0	0	794	17	0
Convertible	598	0	0	898	7	0
Estate car	625	0	0	938	17	0
Husky	465	0	0	698	17	0
HUMBER						
Hawk	840	0	0	1,261	7	0
(automatic)	955	0	0	1,433	17	0
Estate car	975	0	0	1,463	17	0
Touring limousine	920	0	0	1,381	7	0
ISETTA (Gt. Britain)						
300	232	8	5	349	19	6
600	319	0	0	479	17	0
JAGUAR						
2.4	996	0	0	1,495	7	0
Special equip. model	1,019	0	0	1,529	17	0
3.4	1,114	0	0	1,672	7	0
XK150 hardtop	1,175	0	0	1,763	17	0
(automatic)	1,303	0	0	1,955	17	0
Special equip. model	1,292	0	0	1,939	7	0
Convertible	1,195	0	0	1,793	17	0
Roadster						
Mark VIII	1,219	0	0	1,892	17	0
(automatic)	1,331	0	0	1,997	17	0
JENSEN						
541	1,435	0	0	2,153	17	0
541 de luxe	1,750	0	0	2,626	7	0
541 R	1,910	0	0	2,866	7	0
Interceptor	1,800	0	0	2,701	7	0
LANCIA						
Appia Series II	1,125	0	0	1,668	17	0
Aurelia Gran Turismo	2,230	0	0	3,346	7	0
Flaminia	2,500	0	0	3,715	7	0

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	£	s	d	£	s	d	£	s	d	
LINCOLN										
Capri	2,600	0	0	3,901	7	0	750	0	0	
Première	2,869	10	0	4,309	12	0	437	0	0	
Continental hardtop	3,142	10	0	4,715	2	0	505	0	0	
LLOYD										
LP600	390	0	0	586	7	0	530	10	0	
LC600 Cabrio	427	0	0	641	17	0	894	10	0	
LS600 Combi	405	0	0	608	17	0	987	0	0	
LOTUS										
Seven	690	0	0	1,036	7	0	Frigate de luxe	894	10	0
Elite	1,300	0	0	1,951	7	0	Transfuide	894	10	0
Sports	1,021	0	0	1,511	2	0	Domaine estate car	894	10	0
Club	1,309	0	0	1,937	7	0	RILEY			
Le Mans 75	1,625	0	0	2,405	4	0	One-point-five	575	0	0
MEADOWS							Two-point-six	940	0	0
Frisky	299	0	0	449	17	0	(automatic)	1,045	0	0
Friskysport	322	0	0	484	7	0	ROLLS-ROYCE			
MERCEDES-BENZ							Silver Cloud	3,795	0	0
180	1,195	0	0	1,793	17	0	Limousine	4,595	0	0
180D (diesel)	1,295	0	0	1,889	17	0	Freestone and Webb	5,282	0	0
190	1,259	0	0	1,976	7	0	Hoopers	5,085	0	0
190SL	1,930	0	0	2,896	7	0	H. J. Mulliner	5,550	0	0
219	1,430	0	0	2,146	7	0	James Young	5,010	0	0
220S	1,595	0	0	2,393	17	0	Silver Wraith	5,638	0	0
300 (automatic)	2,600	0	0	5,401	7	0	F. and W. limousine	5,638	0	0
300SL Roadster	3,750	0	0	5,626	7	0	7-passenger	5,752	0	0
MERCURY (American)							Park Ward	5,495	0	0
Medalist	1,503	0	0	2,255	17	0	7-passenger	5,805	0	0
Monterey	1,561	10	0	2,343	10	0	Land Rover II 88	640	0	0
Montclair	1,888	0	0	2,833	7	0	Diesel	740	0	0
Parklane	2,224	10	0	3,368	2	0	109 Basic	730	0	0
Commuter estate car	1,778	0	0	2,665	7	0	Diesel	820	0	0
MERCURY (Canadian)							107n estate car	815	0	0
Monterey	1,481	0	0	2,222	17	0	SIMCA ARONDE	883	0	0
Photon	1,640	0	0	2,461	7	0	Aronde 1300	963	0	0
Montclair	1,716	0	0	2,575	7	0	Aronde Chatelaine	1,045	0	0
Photon	1,765	0	0	2,649	17	0	Elysée 1300	999	0	0
METROPOLITAN							Monthéléry	599	0	0
Hardtop	498	10	0	749	2	0	Grande Large (Flash)	625	0	0
Convertible	516	0	0	775	7	0	Grande Large (Special)	679	0	0
M.G.							SIMCA VEDETTE	705	0	0
MGA	663	0	0	995	17	0	Beaulieu	965	0	0
Hardtop	724	0	0	1,087	7	0	SINGER	532	0	0
Twin Cam MGA	843	0	0	1,265	17	0	Gazelle	598	0	0
Magnette	714	0	0	1,072	7	0	Convertible	665	0	0
MORGAN							Estate car	695	0	0
4/4 Series II	498	0	0	748	7	0	SKODA			
Competition	550	0	0	826	7	0	440	525	0	0
Plus 4 (TR) 2-seater	645	0	0	968	17	0	Estate car	695	0	0
Convertible	693	0	0	1,040	17	0	450 convertible	725	0	0
Plus 4 (Vanguard)	594	0	0	892	7	0	STANDARD			
Convertible	641	0	0	962	17	0	Eight	425	0	0
MORRIS							Super Ten	535	0	0
Minor 1000 2-door	416	0	0	625	7	0	Pennant	485	0	0
2-door de luxe	433	10	0	651	12	0	Companion estate car	495	0	0
4-door	441	0	0	662	17	0	Ensign	590	0	0
4-door de luxe	462	0	0	694	7	0	Vanguard III	675	0	0
Tourer	416	0	0	625	7	0	(automatic)	790	0	0
Tourer de luxe	433	0	0	651	12	0	Estate car	765	0	0
Traveller	471	0	0	708	12	0	Sportmans	820	0	0
Traveller de luxe	488	10	0	734	2	0	STUDEBAKER			
Cowley	555	10	0	834	12	0	Scotsman	1,130	0	0
Oxford III	589	0	0	884	17	0	Estate car	1,240	0	0
Traveller	665	0	0	999	17	0	Commander	1,400	0	0
OLDSMOBILE							President	1,490	0	0
88	1,820	0	0	2,731	7	0	SUNBEAM			
Super 83	1,965	0	0	2,948	17	0	Rapier	695	0	0
98	2,260	0	0	3,391	7	0	Convertible	735	0	0
PACKARD							TRIUMPH	699	0	0
4-door Sedan	1,680	0	0	2,521	7	0	TR3	1,049	17	0
Station Wagon	1,745	0	0	2,623	17	0	Hardtop	734	0	0
Hawk hardtop	2,004	0	0	3,007	7	0	TURNER			
PANHARD							A.35 Sports	575	0	0
Dyna Grand Standing	702	8	8	1,055	0	0	UNICAR	826	17	0
Convertible	1,032	0	8	1,550	0	0	Model T de luxe	283	0	0
PEERLESS							VAUXHALL	425	17	0
G.T. 2-litre	993	0	0	1,498	7	0	Victor	498	0	0
PEUGEOT							Victor Super	520	0	0
203	633	9	1	952	8	2	Estate car	620	0	0
403	796	2	11	1,195	11	5	Velox III	655	0	0
Estate car	865	0	0	1,298	17	0	Cresta II	715	0	0
PLYMOUTH							VOLKSWAGEN			
Savoy Vee-8	1,718	0	0	2,578	7	0	Basic	435	0	0
Belvedere convertible	1,790	0	0	2,686	7	0	De Luxe	505	0	0
Savoy Suburban	1,915	0	0	2,773	17	0	Convertible	682	10	0
Fury	1,890	0	0	2,791	7	0	Karmann-Ghia coupé	822	10	0
PONTIAC							Convertible	929	0	0
Chieftain Catalina	1,980	0	0	2,971	7	0	1,394	17	0	
Bonneville Custom	2,300	0	0	3,461	7	0	WOLSELEY			
Super Chief Catalina	2,040	0	0	3,061	7	0	1500	530	0	0
Star Chief Catalina	2,150	0	0	3,226	7	0	Fifteen-fifty	660	0	0
PORSCHE							Six-ninety III	850	0	0
346A/1600 fixed head	1,330	0	0	1,996	7	0	(automatic)	955	0	0
Convertible D	1,330	0	0	1,996	7	0	1,433	17	0	
Hardtop (detachable)	1,450	0	0	2,176	7	0				
Cabriolet (detachable)	1,490	0	0	2,236	7	0				
356A/1500 fixed head	2,100	0	0	3,151	7	0				
Carrera hardtop	2,220	0	0	3,331	7	0				
Carrera Cabriolet	2,260	0	0	3,391	7	0				
PRINCESS										
IV	2,250	0	0	3,376	7	0	THREE-WHEELERS			
IV limousine	2,360	0	0	3,541	7	0	A.C. Petite II	319	0	0
L.W.B. models	2,150	0	0	3,226	7	0	Bond 2-seater	222	0	0
RAMBLER							4-seater	254	0	0
De luxe	1,250	0	0	1,876	7	0	Coronet	360	0	0
Super	1,285	0	0	1,928	17	0	Heinkel	312	15	0
Estate car	1,375	0	0	2,063	17	0	Messerschmitt KR200	260	0	0
Custom	1,350	0	0	2,026	7	0	Reliant Regal	346	0	0
Estate car	1,440	0	0	2,161	7	0	Tourette Senior	259	0	0

